

Survey taker number: 01/07

1-1

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching	✓		
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

1-2

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes No

Rent:  Yes No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
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**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water			
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Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

#1-3

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: ~~Yes~~ No  
Rent: ~~Yes~~ No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching	✓		
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

1-4

Hi, my name is ~~XXXXXXXXXX~~. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

95641

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

95641

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) The Point

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants	✓		
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

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14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
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- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
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  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: Dan Sibert

Address: 520 S. 2<sup>nd</sup> Street, Rio Vista 94571

Phone: ~~949~~ 707-208-3004

Email: N/A

Survey taker number: 01/07

1-5

Hi, my name is ~~XXXXXXXXXX~~. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95831

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95814

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants		✓	
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Jaime Collard  
Address: 7327 River Place way  
Phone: (914) 215 6845  
Email: Jaime 916 @ gmail.com

Survey taker number: 01/07

1-6

Hi, my name is ~~XXXXXXXXXX~~. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat

M. Other: power boat

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting

G. Other walking

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

94925

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

94925

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) N/A

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic		✓	
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)	✓		
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes                      No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

1-7

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No   
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat .

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) The Point  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
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Thank you for those responses. Now <sup>AT</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

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Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
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  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
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23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

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Name:

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Survey taker number: 04/07

1-8

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1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
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- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
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3. Approximately how many times per year do you visit the Delta for recreational boating?

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**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
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- F. Stockton, Windmill Cove area
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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

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8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

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10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓	✓	
Turbid/muddy water		✓	
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
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- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. <sup>AA</sup> I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have <sup>the</sup> question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 0107

1-9

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No

Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B.. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)		✓	
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. <sup>AM</sup>I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: ~~XXXXXXXXXX~~ 01/07

1-10

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes No  
Rent:  Yes No

If No to both rent and own then end survey.

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
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3. Approximately how many times per year do you visit the Delta for recreational boating?

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- D. 11-15
- E. 15-20
- F. More than 20

If Answer to 3 is A, then end survey.

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
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- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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Long or frequent 5 mph speed zones before reaching fast water	✓		
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Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

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- B. Some reduction in frequency of boating activity in the Delta overall
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- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way <sup>or</sup> the other.
- B. I am somewhat confident <sup>that</sup> DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel <sup>^I</sup> construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

1-12

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No

Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B.. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)	✓		
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.

E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
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  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
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  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01107

1-13

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes

No

Rent:  Yes

No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

A. Cabin cruiser

B. Wakeboard boat

C. Ski boat

D. Runabout

E. Pontoon boat

F. House boat

G. Day boat

H. Jet Boat

I. Big Cat

J. Performance boat

K. Sail boat

L. Kayak/Canoe/Other non-motorized boat

M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

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- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-3

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other Tubing

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ ~~95670~~ 95670

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95670

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Wickler is close by  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants		✓	
Turbid/muddy water			✓
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?

- A. I would be somewhat more likely to visit the Clarksburg area.
- B. I would be much more likely to visit the Clarksburg area.
- C. The construction would not affect the likelihood of me visiting the Clarksburg area.
- D. I would be somewhat less likely to visit the Clarksburg area.
- E. I would be much less likely to visit the Clarksburg area.
- F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-4

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

If No to both rent and own then end survey.

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

If Answer to 3 is A, then end survey.

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
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- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

94633

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) B3W

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - ~~B. I would be much more likely to visit the Clarksburg area.~~
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - ~~D. I would be somewhat less likely to visit the Clarksburg area.~~
  - ~~E. I would be much less likely to visit the Clarksburg area.~~
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-5

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 94571

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 94571

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Walnut Grove (dock)

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants		✓	
Turbid/muddy water		✓	
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		<del>✓</del>	✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

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Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-6

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other Manage Reclamation

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other Pittsburg

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

94565

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 94565

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Pittsburg  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water		✓	
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

<sup>I</sup>  
Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.

18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: Chris Lanzafame  
Address: 4301 Inverness Dr  
Pittsburg Ca 94535  
Phone: 925-698-9252  
Email: chris@lanzafame

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Survey taker number: 3

3-7

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: PWC

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

99505

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Discovery Bay  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants	✓		
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.



The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

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- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
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- E. I would be much less likely to visit the Hood Supply Company.
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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Ken Martin

Address: Disco Bay, Ca 94505

Phone: (209) 482-7409

Email: Crazy1@GtNet.Net

Survey taker number: 3

3-8

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: ~~Runabout~~ Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
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- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95240

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95240

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

- Name of Marinas: 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants		✓	
Turbid/muddy water		<del>✓</del>	✓
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		✗	✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-9

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes

No

Rent: Yes

No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: pleasure craft / fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other: None

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other All Areas Above

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

95640

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

95640

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

- Name of Marinas: 1) WIPPYS  
2) TOWER PARK  
3) VIENAS PARK

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	<del>✓</del>		✓
Nearby waterside bars and restaurants		✓	
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

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- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
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- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>if</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminous Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - E. I would be much less likely to visit the Clarksburg area.
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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info: ✓  
or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-10

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95212

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95212

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Wimpy's  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely ✓	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants			✓
Turbid/muddy water			✓
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 3

3-11

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent: Yes   No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95652

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95652

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Marinas Delta  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water		✓	
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

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  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info: ✓  
or

Name:

Address:

Phone:

Email:

Survey taker number: 03

3-12

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ Sands harbor

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) rusty port hole

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
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<sup>F</sup>  
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To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
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  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: Bob

Address:

Phone:

Email:

Survey taker number: 03

3-13



Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat

M. Other: Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

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- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
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Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: Sierra Lissick

Address: 1710 Wildflower Ct. Fairfield, CA 94534

Phone: (707) 430-3377

Email: Angelcornucopia@gmail.com

Survey taker number: ~~3~~ 3

3-15

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**If No to both rent and own then end survey.**

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- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

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- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 94571

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 94571

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Point Marina (Delta Marina)  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water		✓	
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>react</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question <sup>^ I</sup> about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: JOE W BENTO

Address: PO BOX 697 RIO VISTA

Phone: 707 374 5550

Email: JB@MDBDESIGNSIA/TL.COM

Survey taker number: 4

4-1

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 93711

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 93711

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Tiki Lagoon  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
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Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes                      No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
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- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
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- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 4

4-4

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                      No  
Rent:  Yes                      No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: wellcraft

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95205

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95205

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants		✓	
Turbid/muddy water		✓	
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
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Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 4

4-5

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: WALL around

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
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5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95205

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95205

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Rest marin  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes
  No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

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17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
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- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?

- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?

- A. I would be somewhat more likely to visit the Clarksburg area.
- B. I would be much more likely to visit the Clarksburg area.
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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

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Prefer not to give contact info:  
or

Name:

Address:

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Survey taker number: 4

4-6

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First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No   
Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Pontoon

3. Approximately how many times per year do you visit the Delta for recreational boating?

- ~~A. I do not go boating in the Delta.~~
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other Swimming

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 94571

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 94571

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Hap's Bait  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water		✓	
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>F</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 4

4-7

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes

No

Rent:  Yes

No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
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- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
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Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
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- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?

- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
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- C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?

- A. I would be somewhat more likely to visit the Clarksburg area.
- B. I would be much more likely to visit the Clarksburg area.
- C. The construction would not affect the likelihood of me visiting the Clarksburg area.
- D. I would be somewhat less likely to visit the Clarksburg area.
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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 4

4-8

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes

No

Rent:  Yes

No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 94571

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 94571

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Sherman Lake  
2) Bidee Berra's  
3) Eddo's

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants	✓		
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 4

4-9

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

If No to both rent and own then end survey.

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

If Answer to 3 is A, then end survey.

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 95653

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 95653

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) public launch (not marina)  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants	<del>✓</del>	✓	<del>✓</del>
Turbid/muddy water		✓	<del>✓</del>
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	<del>✓</del>
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
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17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 4

4-10

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes

No

Rent:  Yes

No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ 94550

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ 94550

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Rio Vista Marina  
2) Viera's Resort  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants	✓		
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching	✓		
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: John Howard  
Address: 2083 BURKA VISTA  
Phone: 925-321-5971  
Email: WINES@383@gmail.com

Survey taker number: 04

4-11

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

If No to both rent and own then end survey.

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

If Answer to 3 is A, then end survey.

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

95757

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ Same

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_ don't remember  
2) discovery park?  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants			✓
Turbid/muddy water			✓
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

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There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Bret Yarborough  
Address: 7120 Bari Ct Elk Grove CA 95757

Phone: 916-587-3838

Email: N/A

Survey taker number: 4

4-12

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer *Charter Boat goes to Fort Bragg Ocean Fishing*

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_ *Mendocino County (Fort Bragg)*

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

*NO OFF SEASON*

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_ *95041*

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Delta Marina  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants		✓	
Turbid/muddy water			✓
Heavy barge/boat traffic		✓	✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds	<del>✓</del>		✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes                      No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
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- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

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- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Barry Canavaro

Address: 54 Birch Ridge Dr. Rio Vista

Phone: 916 870-4225

Email: fishon@fishhookers.com

Rio Vista Bass Derby

Survey taker number: 4

4-14

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                       No  
Rent:  Yes                       No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
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- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

95252

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

95252

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants		✓	
Turbid/muddy water			✓
Heavy barge/boat traffic		✓	
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

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- A. No change in location of my boating activity.
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- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

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17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

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- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

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18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
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  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
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  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

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To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

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Survey taker number: 4

4-15

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes

No

Rent: Yes

No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

A. Cabin cruiser

B. Wakeboard boat

C. Ski boat

D. Runabout

E. Pontoon boat

F. House boat

G. Day boat

H. Jet Boat

I. Big Cat

J. Performance boat

K. Sail boat

L. Kayak/Canoe/Other non-motorized boat

M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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- E. Clarksburg, Hood, Walnut Grove, Locke area.
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6. Where do you keep your boat during the summer

- ~~A. Away from the Delta in dry storage or at my residence.~~
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- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

~~94561~~ 94561

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

94561

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water		✓	
Nearby waterside bars and restaurants		✓	
Turbid/muddy water		✓	
Heavy barge/boat traffic			✓
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
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- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
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23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
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Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Rafe Goornitch  
Address: 228 California St.  
Rio Vista, CA 94571  
Phone: (415) 602-5619  
Email: rgoornitch@gmail.com



Handwritten scribbles and signatures, including the word "Heron" and "OXPO" partially visible.

Survey taker number: 4

4-16

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

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Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

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- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
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- J. Performance boat
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- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

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- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other Tubing

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Veras \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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Long or frequent 5 mph speed zones before reaching fast water			✓
Nearby waterside bars and restaurants	✓		
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Heavy barge/boat traffic			✓
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Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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- E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: *Danny Anderson*

Address: *939 clunes ave San Francisco Ca 94124*

Phone: *415 716 5686*

Email:

Survey taker number: MM07

7-1

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

94571

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

94571

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) The Point  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

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  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

1

Survey taker number: 01/16/07

7-2

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

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Own: Yes  No   
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**If No to both rent and own then end survey.**

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- A. Cabin cruiser
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- E. Pontoon boat
- F. House boat
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- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
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- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

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- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
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- C. Yes, bait or fishing supplies
- D. Yes, other items
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

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- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. <sup>AM</sup> I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

7-3

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?  
First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No   
Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer N/A

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) The River Boat  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		✗
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching	✓		
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>^net</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have <sup>^I</sup> a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area. N/A
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: DX/07

7-4

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No

Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat

M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

- Name of Marinas: 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water		✓	
Heavy barge/boat traffic			✓
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)			✓
High winds			✓

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Jim Machado

Address: 321 Sunset Court, Rio Vista, 94571

Phone: (707) 374-5423

Email:

Survey taker number: 01/07

7-5

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No

Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: power boat

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			✓
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

7-4

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First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                      No

Rent:  Yes                      No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
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- F Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

94571

8. Where do you keep your boat in the off season?

- A Away from the Delta in a slip in the water
- B Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

94571

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A Yes, Gas
- B Yes, Food and beverages
- C Yes, bait or fishing supplies
- D Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

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12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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Long or frequent 5 mph speed zones before reaching fast water			✓
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Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching	✓		
Loud noise (traffic, construction, etc.)		✓	
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

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- B. Some reduction in frequency of boating activity in the Delta overall
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- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - E. I would be much less likely to visit the Clarksburg area.
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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

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Email:

Survey taker number: 07

7-8

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Fishing Boat

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A West Delta around Antioch Suisun Marsh area
- B North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
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- E Clarksburg, Hood, Walnut Grove, Locke area.
- F Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

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12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
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Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

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Survey taker number: 10/11/07

7-9

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Own:  Yes

No

Rent: Yes

No

**If No to both rent and own then end survey.**

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- A. Cabin cruiser
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- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat

M. Other: sea skimmer

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A. I do not go boating in the Delta.

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C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

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C. Water Skiing

D. Cruising

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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

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8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

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10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Brandon Island  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
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Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation. <sup>not</sup>

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

7-11

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A West Delta around Antioch Suisun Marsh area
- B North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C South Delta around Discovery Bay area
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- F Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B.. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A Yes, Gas
- B Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Vieras  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
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- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

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- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 011/07

7-12

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes   No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: N/A

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other: sightseeing

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- N/A* D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

N/A

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- N/A* C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

N/A

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching	✓		
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

(Yes)

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

*I*  
Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 09/07

7-13

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
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Loud noise (traffic, construction, etc.)	✓		
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13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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- D. <sup>AM</sup> I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

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- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: 011/07

7-14

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1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No   
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**If No to both rent and own then end survey.**

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- A. Cabin cruiser
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- D. Runabout
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- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

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- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
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- E Clarksburg, Hood, Walnut Grove, Locke area.
- F Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- N/A C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- N/A B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A Yes, Gas
- B Yes, Food and beverages
- C Yes, bait or fishing supplies
- D Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. <sup>AM</sup> I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NCT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: \_\_\_\_\_

~~12/13~~ 12/13 12-2

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

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10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Owl Harbor  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	X		
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Heavy barge/boat traffic	X		
Excellent birdwatching		X	
Loud noise (traffic, construction, etc.)	X		
High winds		X	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

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- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: 01/07

7-14

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1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No   
Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- N/A* C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B.. Away from the Delta in dry storage or at my residence
- N/A* C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)		✓	
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. <sup>AM</sup> I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: \_\_\_\_\_

~~12/13~~ 12/13

12-2

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                      No

Rent: Yes                              No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Owl Harbor  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	X		
Long or frequent 5 mph speed zones before reaching fast water		X	
Nearby waterside bars and restaurants	X		
Turbid/muddy water	X		
Heavy barge/boat traffic	X		
Excellent birdwatching		X	
Loud noise (traffic, construction, etc.)	X		
High winds		X	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminous Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: \_\_\_\_\_

~~12/13~~ 12/13

12-3

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		X	
Long or frequent 5 mph speed zones before reaching fast water	X		
Nearby waterside bars and restaurants	X		
Turbid/muddy water	X		
Heavy barge/boat traffic	X		
Excellent birdwatching	X		
Loud noise (traffic, construction, etc.)	X		
High winds		X	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1-5 times.
- B. Yes 6-10 times
- C. Yes 11-20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

6-2

Survey taker number: 06:15

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?  
First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
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3. Approximately how many times per year do you visit the Delta for recreational boating?

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- D. 11-15
- E. 15-20
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**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

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- B. Wake boarding
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5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	/		
Long or frequent 5 mph speed zones before reaching fast water	/		
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Heavy barge/boat traffic	/		
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Loud noise (traffic, construction, etc.)		/	
High winds			/

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

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17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

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22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number:

0315

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes  No

Rent: Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?  
\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B.. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?  
\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Kenia

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Long or frequent 5 mph speed zones before reaching fast water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nearby waterside bars and restaurants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Turbid/muddy water	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heavy barge/boat traffic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excellent birdwatching	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Loud noise (traffic, construction, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High winds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am <sup>not</sup> very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: 06.F.15

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D.  Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B.  1-5
- C.  6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A.  Fishing
- B.  Wake boarding
- C.  Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other Sac

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

- Name of Marinas: 1) Delta Marina
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

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There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am <sup>not</sup> very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
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- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: Laurie Mueller

Address: 1703 Center Ave  
Martinez CA 94553

Phone:

Email: lkm712@aol.com

Survey taker number:

36115

6-6

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Bait shops in Rio Vista  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	<input checked="" type="checkbox"/>		
Long or frequent 5 mph speed zones before reaching fast water	<input type="checkbox"/>		
Nearby waterside bars and restaurants	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Turbid/muddy water	<input checked="" type="checkbox"/>		
Heavy barge/boat traffic	<input type="checkbox"/>		
Excellent birdwatching			<input checked="" type="checkbox"/>
Loud noise (traffic, construction, etc.)	<input type="checkbox"/>		
High winds		<input checked="" type="checkbox"/>	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?

- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
- B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
- C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
- D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
- E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
- F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?

- A. I would be somewhat more likely to visit the Clarksburg area.
- B. I would be much more likely to visit the Clarksburg area.
- C. The construction would not affect the likelihood of me visiting the Clarksburg area.
- D. I would be somewhat less likely to visit the Clarksburg area.
- E. I would be much less likely to visit the Clarksburg area.
- F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: 06 J. 15

Hi, my name is \_\_\_\_\_. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?  
First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                      No  
Rent:  Yes                      No

If No to both rent and own then end survey.

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: Fishing

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

If Answer to 3 is A, then end survey.

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other knee boarding

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Rio Vista  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants			✓
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching		✓	
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

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- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
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The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

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To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
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  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
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- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
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- E. I would be much less likely to visit the Clarksburg Marina.
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21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
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- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: 06915

6-8

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B.. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Delta Marina

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing		✓	
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants	✓		
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

<sup>I</sup> Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1-5 times.
- B. Yes 6-10 times
- C. Yes 11-20 times
- D. Yes more than 20 times
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23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: JOHN WITTRIL  
Address: 17348 GRAND ISLAND RD  
Phone: WALNUT GROVE, CALIF 95690  
Email:

Survey taker number: 06 E 15

6-9

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First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own: Yes                      No  
Rent: Yes                      No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
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- E. Pontoon boat
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3. Approximately how many times per year do you visit the Delta for recreational boating?

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- C. 6-10
- D. 11-15
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- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
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6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
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- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?  
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8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
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9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?  
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- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
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11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Delta Marina  
2) \_\_\_\_\_  
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12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
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Loud noise (traffic, construction, etc.)	✓		
High winds	✓		

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
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To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

Survey taker number: EG 06

6-10

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                       No  
Rent:  Yes                       No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

- Name of Marinas: 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing	✓		
Long or frequent 5 mph speed zones before reaching fast water	✓		
Nearby waterside bars and restaurants			✓
Turbid/muddy water	✓		
Heavy barge/boat traffic	✓		
Excellent birdwatching			✓
Loud noise (traffic, construction, etc.)	✓		
High winds		✓	

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

*not*  
Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1-5 times.
- B. Yes 6-10 times
- C. Yes 11-20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

*no*

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name:

Address:

Phone:

Email:

Survey taker number: 6

6-11

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

A. I do not go boating in the Delta.

B. 1-5

C. 6-10

D. 11-15

E. 15-20

F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

A. Fishing

B. Wake boarding

C. Water Skiing

D. Cruising

E. Visiting waterside bars and restaurants

F. Hunting

G. Other Tubing  
Free boarding

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Oxbow rd  
2) BMW  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			
Long or frequent 5 mph speed zones before reaching fast water			
Nearby waterside bars and restaurants			
Turbid/muddy water			
Heavy barge/boat traffic			
Excellent birdwatching			
Loud noise (traffic, construction, etc.)			
High winds			

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I am somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: *Barbara*

Address:

Phone: *707-685-5006*

Email:

Survey taker number: 6

6-12

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No  
Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

*circled to fishing*

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Vieres  
2) Blue Point  
3) Hages

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			
Long or frequent 5 mph speed zones before reaching fast water			
Nearby waterside bars and restaurants			
Turbid/muddy water			
Heavy barge/boat traffic			
Excellent birdwatching			
Loud noise (traffic, construction, etc.)			
High winds			

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>not</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name: Michael Hooper

Address: 2871 Forebay RD

Phone: 330 391 6917

Email: formyfogg4@yahoo.com

Survey taker number: 04

6-14

Hi, my name is Estefania. I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                      No  
Rent: Yes                                      No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Bento  
2) Discovery  
3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			
Long or frequent 5 mph speed zones before reaching fast water			
Nearby waterside bars and restaurants			
Turbid/muddy water			
Heavy barge/boat traffic			
Excellent birdwatching			
Loud noise (traffic, construction, etc.)			
High winds			

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>try</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>^ I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

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19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1-5 times.
- B. Yes 6-10 times
- C. Yes 11-20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:

or

Name: DAVID KEAN

Address: 340 MONTEZUMA #6

Phone: 702 372-3679

Email:

6-15

Survey taker number: 06

Hi, my name is \_\_\_\_\_ . I am a student at the University of California at Santa Cruz. I am working on this project as a part of my studies. The purpose of this survey is to analyze recreational boating activities in the Delta and to measure any changes in recreation and visitation that might occur during construction of the proposed Twin Tunnel Project, sometimes called the BDCP or California WaterFix project. Your responses will only be reported in aggregate. Can you take about fifteen minutes with me to complete our survey?

First, I would like to get some general information about your recreational boating activities.

1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes                      No  
Rent:  Yes                      No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
- G. Day boat
- H. Jet Boat
- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other \_\_\_\_\_

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

- A. West Delta around Antioch Suisun Marsh area
- B. North Delta around Rio Vista, Walnut Grove, Steamboat Slough area
- C. South Delta around Discovery Bay area
- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
Excellent fishing			
Long or frequent 5 mph speed zones before reaching fast water			
Nearby waterside bars and restaurants			
Turbid/muddy water			
Heavy barge/boat traffic			
Excellent birdwatching			
Loud noise (traffic, construction, etc.)			
High winds			

13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

This map shows the tunnel construction project. The plan is to build three new intakes to divert water from the Sacramento River near the town of Hood, just downstream from Sacramento. The water diverted at Hood will be conveyed through twin forty foot diameter tunnels buried 150 feet underground beneath Delta islands and sloughs. The water will then be sent south to irrigate Central Valley farms and supply Southern California cities.

This map shows the route the tunnels will take. This is a picture of a tunnel boring machine similar to ones that will be used on the project. Shafts will be excavated down to the tunnels to supply the tunnel boring operations and barges will carry materials, supplies and equipment to be lowered down the shafts.

The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

The California Department of Water Resources produced an Environmental Impact Report (EIR) on the tunnel project. The EIR considered the impacts of the project on recreation and concluded as follows:

“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
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DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

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Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
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Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
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20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

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*Wouldn't go*  
Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1-5 times.
- B. Yes 6-10 times
- C. Yes 11-20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

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1. Do you own a boat or do you rent a houseboat or other type of boat to go boating?

Own:  Yes  No

Rent:  Yes  No

**If No to both rent and own then end survey.**

2. Which best describes your boat or boats (select all that apply)?

- A. Cabin cruiser
- B. Wakeboard boat
- C. Ski boat
- D. Runabout
- E. Pontoon boat
- F. House boat
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- I. Big Cat
- J. Performance boat
- K. Sail boat
- L. Kayak/Canoe/Other non-motorized boat
- M. Other: \_\_\_\_\_

3. Approximately how many times per year do you visit the Delta for recreational boating?

- A. I do not go boating in the Delta.
- B. 1-5
- C. 6-10
- D. 11-15
- E. 15-20
- F. More than 20

**If Answer to 3 is A, then end survey.**

4. What recreational boating activities do you usually undertake (select all that apply)?

- A. Fishing
- B. Wake boarding
- C. Water Skiing
- D. Cruising
- E. Visiting waterside bars and restaurants
- F. Hunting
- G. Other Camping

Bars & Res

5. Which of the following areas of the Delta best describes the areas of the Delta that you use for these recreational activities (circle all that apply)?

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- D. Central Delta around Korth's Pirate's Lair, Bethel Island, Franks Tract area
- E. Clarksburg, Hood, Walnut Grove, Locke area.
- F. Stockton, Windmill Cove area
- G. Other \_\_\_\_\_

6. Where do you keep your boat during the summer

- A. Away from the Delta in dry storage or at my residence.
- B. Away from the Delta in a slip in the water
- C. In the Delta in dry storage or at my residence out of the water
- D. In the Delta in a slip in the water
- E. I have a home in the Delta with an attached dock where I keep my boat

7. If answer to 6 is A or B, what is the zip code where you keep your boat during summer?

\_\_\_\_\_

8. Where do you keep your boat in the off season?

- A. Away from the Delta in a slip in the water
- B. Away from the Delta in dry storage or at my residence
- C. In the Delta in dry storage or at my residence out of the water
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- E. I have a home in the Delta with an attached dock where I keep my boat

9. If the answer to 8 is A or B, what is the zip code where you keep your boat during the off season?

\_\_\_\_\_

10. When you visit the Delta, do you make purchases of gas, food and beverages, bait or fishing supplies, or other items from Delta marinas? Circle all that apply.

- A. Yes, Gas
- B. Yes, Food and beverages
- C. Yes, bait or fishing supplies
- D. Yes, other items
- E. No

11. If answer to 10 is A, B, C, or D, then: Which marina or marinas do you most often make purchases at?

Name of Marinas: 1) Wera's

2) \_\_\_\_\_

3) \_\_\_\_\_

12. In the table below is a list of conditions that you might encounter on different sloughs while boating. For each of these conditions, please indicate how they would affect the likelihood that you would do your recreational boating on those sloughs.

Condition	More Likely	No Change	Less Likely
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Loud noise (traffic, construction, etc.)			
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13. Have you heard about the plan to construct tunnels on the Sacramento River to divert water to the Central Valley farms and Southern California cities?

Yes

No

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The tunnel boring machines will produce about 30,000,000 cubic yards of excavated material. The excavated material will be a combination of mud, peat soil, and liquids used to lubricate the cutting heads of the boring machine. A dump truck like the one in this picture holds about 12 cubic yards so that is equal to about two and half million truck loads of excavated material. The excavated material will be hauled up the shafts and loaded onto barges. The barges will then take the material to deposit sites on Delta Islands. This map shows the location of eight new barge landings that will be constructed and the locations where the excavated materials will be deposited. This is a picture of a tugboat and barge similar to the ones that will be used on the tunnel project. The map also shows the routes that barges will take to deliver materials and equipment and to haul away excavated tunnel material.

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“Construction of ... intakes and water conveyance facilities would result in disruption to recreational opportunities. Indirect effects on recreation experiences may occur as a result of impaired access, construction noise, or negative visual effects associated with construction. Overall, construction and geotechnical exploration may occur year-round and last from 2.5 to 13.5 years at individual construction sites near recreation sites or areas and in-river construction would be primarily limited to June 1 through October 31 each year, which would result in a long-term reduction of recreational opportunities or experiences.”

There will also be two drilling barges that will drill into the river bottom to test the soil conditions along the tunnel route. The drilling will occur at between 90 and 100 sites on Delta waterways. Overwater drilling will occur 6 days per week in the summer and fall months for about three years. This is a map that shows the locations of the drilling, both on land and in the water.

The use of barges for water facilities construction, overwater drilling, and construction of the temporary barge unloading facilities may require partial channel closures and will require use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including 5-mph speed-restricted zones extending upstream and downstream of construction within the waterway and extending upstream and downstream of barge facilities to reduce wake and maintain a safe work area in the vicinity of the construction activities.

Within the speed-restricted zones high-speed recreation (e.g., waterskiing, wakeboarding, and tubing) would effectively be eliminated.

14. Once the tunnel construction project begins, which of the following best describes the likely change in the frequency of your boating activity in the Delta overall in response to the construction described above?

- A. No change in frequency of boating activity in the Delta overall
- B. Some reduction in frequency of boating activity in the Delta overall
- C. Significant reduction in frequency of boating activity in the Delta overall
- D. Increase in frequency of boating activity in the Delta overall.
- E. I will stop boating in the Delta altogether.

15. Once tunnel construction begins, which of the following best describes the likely change in the location of your boating activity?

- A. No change in location of my boating activity.
- B. I would change the location of my boating within the Delta to avoid construction activity but would not switch to boat at locations other than the Delta.
- C. I would occasionally avoid the Delta by switching to boat at locations other than the Delta.
- D. I would often avoid the Delta by switching to boat at locations other than the Delta.
- E. I would always avoid the Delta by switching to boat at locations other than the Delta.

The tug boats that will be used to push barges for this project have the potential for bottom scour from propeller wash. This may cause an increase in muddy water along the barge routes.

16. Which of the following best describes your reaction to the potential for an increase muddy water along barge routes?

- A. This is not a concern for me.
- B. I would be somewhat likely to avoid areas where barges create muddy conditions.
- C. I would be very likely to avoid areas where barges create muddy conditions.
- D. I would be somewhat likely to boat more often in areas where barges create muddy conditions.
- E. I would be very likely to boat more often in areas where barges create muddy conditions.

DWR says that they will implement a barge operations plan and use their best efforts to reduce or avoid any increases in muddy water from barge operations and to reduce or avoid barge impacts to recreation in general.

17. Which of the following best describes your reaction to DWR's intention to implement a barge operations plan?

- A. I have no reaction one way or the other.
- B. I am somewhat confidence that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- C. I am very confident that DWR will make a good faith effort to reduce muddy water and general impacts to recreation.
- D. I somewhat confident that DWR will not make a good faith effort to reduce muddy water and general impacts to recreation.
- E. I am very confident that DWR will <sup>NOT</sup> make a good faith effort to reduce muddy water and general impacts to recreation.

Thank you for those responses. Now <sup>I</sup> have a question about whether the tunnel construction activities that will take place on land might affect your boating activities.

To facilitate tunnel construction, there will be a new concrete batch plant, excavated material site, and other construction related facilities on Bouldin Island. A new road will be built to connect the construction facility to Highway 12 midway between the Terminus Bridge and the bridge at the B & W Resort. Construction trucks will travel on Highway 12 and turn onto the new road to reach the Bouldin Island construction area. The new turnout on Highway 12 and new road are shown here on this map.

It is estimated that there will be 41% more traffic crossing the Rio Vista Bridge over the Sacramento River during the construction period because of truck and car trips generated by the tunnel project.

The barges and tug boats used for tunnel construction will pass beneath 2 drawbridges on State Highway 12 (here and here) and beneath other Delta drawbridges. Each time a barge passes, the drawbridges will be opened and road traffic will be stopped until the barge clears.

Construction trucks will also use other roadways in various locations throughout the Delta.



18. Which of the following best describes your response to construction vehicles using Delta roadways and bridge openings for barge traffic?
- A. Construction vehicles and bridge openings will not affect my use of the Delta for recreation.
  - B. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat more often.
  - C. Construction vehicles and bridge openings will cause me to use the Delta for recreation much more often.
  - D. Construction vehicles and bridge openings will cause me to use the Delta for recreation somewhat less often.
  - E. Construction vehicles and bridge openings will cause me to use the Delta for recreation much less often.
  - F. Construction vehicles and bridge openings will cause me to stop using the Delta for recreation altogether.

Thank you. I have two questions about how tunnel construction activity might affect your likelihood of visiting the Hood and Clarksburg area. The three intakes that will divert water from the Sacramento River into the tunnels will be built in this area.

This is a map showing construction of the three intakes, which will be located along a six mile stretch of the Sacramento River between Freeport and Courtland. These intake structures are each about 3/4 of a mile long. To build each intake structure, highway 160 will be moved inland away from the river to allow room for the structure, the area will be excavated, and concrete structures will be built. Construction equipment in use will include dump trucks, excavators, bulldozers, and rock drills. Explosive blasting may be used at excavation sites. Helicopter over-flights would occur in connection with installation of new power lines at this area.

To build the in-water portion of these structures, barge-mounted pile drivers will drive foundation piles into the river bottom. There will be about 8,000 piles in all. The pile driving will take place each summer for six years. Four or more pile drivers will be working at the same time. Each time a pile driver strikes a pile, it will produce a sound of 102 decibels or more. 100 decibels is about as loud as your car stereo turned up to full volume. There will be a total of 8,000,000 individual pile strikes.

19. Once construction of the intakes begins in the Clarksburg area, which best describes your response?
- A. I would be somewhat more likely to visit the Clarksburg area.
  - B. I would be much more likely to visit the Clarksburg area.
  - C. The construction would not affect the likelihood of me visiting the Clarksburg area.
  - D. I would be somewhat less likely to visit the Clarksburg area.
  - E. I would be much less likely to visit the Clarksburg area.
  - F. I am sure that I would not visit the Clarksburg area at all during the construction project.

20. The Clarksburg Marina is located across the river and a little over a quarter of a mile from the intake construction site, in view of the pile-driving activities. The Clarksburg Marina is here on the map. Which of the following best describes your response with regard to the Clarksburg Marina once intake construction begins?

- A. I would be somewhat more likely to visit the Clarksburg Marina.
- B. I would be much more likely to visit the Clarksburg Marina.
- C. The construction would not effect the likelihood of me visiting the Clarksburg Marina.
- D. I would be somewhat less likely to visit the Clarksburg Marina.
- E. I would be much less likely to visit the Clarksburg Marina.
- F. I am sure I would not visit the Clarksburg Marina during the construction project.

21. The Hood Supply Company is a bar and grill located next to the intake construction site. Heavy construction trucks and equipment will pass within 100 feet of the restaurant. The Hood Supply Company has both indoor and outdoor seating. Which of the following best describes your response with regard to the Hood Supply Company once intake construction begins?

- A. I would be somewhat more likely to visit the Hood Supply Company.
- B. I would be much more likely to visit the Hood Supply Company.
- C. The construction would not effect the likelihood of me visiting the Hood Supply Company.
- D. I would be somewhat less likely to visit the Hood Supply Company.
- E. I would be much less likely to visit the Hood Supply Company.
- F. I am sure I would not visit the Hood Supply Company during the construction project.

Thank you. I have two final questions about how tunnel construction activities might affect your likelihood of visiting the Meadows Slough / Upper Snodgrass Slough anchorage area. The Meadows Slough is shown here on the map. Construction activities and barge routes near the Meadows Slough are also shown on the map.

22. Have you ever visited the Meadows Slough / Upper Snodgrass Slough anchorage area, and if so how often?

- A. Yes 1–5 times.
- B. Yes 6–10 times
- C. Yes 11–20 times
- D. Yes more than 20 times
- E. No.

23. Once tunnel construction activities begin, how likely will it be for you to use the Meadows Slough / Upper Snodgrass Slough Anchorage area for your boating activities?

- A. It is somewhat likely that I will use the area.
- B. It is very likely that I will use the area.
- C. It is somewhat unlikely that I will use the area.
- D. It is very unlikely that I will use the area.
- E. I am sure that I will not use the area once tunnel construction begins.

Would it be ok if I get your contact information in case I need to contact you to do a follow up survey if there are changes to the proposed project later?

Prefer not to give contact info:  
or

Name:

Address:

Phone:

Email:

