

**SWAMP Monitoring Program for FY 04-05
Stream Bioassessment Monitoring Study**

**Watershed Assessment for the Santa Ana Region
for FY 04-05 through FY 09-10**

1. Long-term (5 year) Plan:

The goal of the Surface Water Ambient Monitoring Program up to now in the Santa Ana Region is to determine the percent area of a given water body that meets water quality standards. Each water body has been pre-selected by Regional Board staff and the sampling points have been pre-determined by a statistician using a randomized sampling design (see Table 1). These water bodies will be sampled during wet and dry seasons to allow for comparisons of water quality between these two periods. Furthermore, these water bodies will be re-sampled every five years to determine if over all water quality has changed.

Each year, a work plan has been developed for each water body to be sampled, a water body specific QAPP plan and a sampling plan. A report will be prepared with the results and interpretations of the data collected. Both the report and the data will be considered during the water quality assessment process required under Section 305 (b) of the Clean Water Act. The following table summarizes the sampling activities that have taken place up under the SWAMP program.

Fiscal Year:	Water Bodies to be Monitored:	Beneficial Uses:	Monitoring Objective:
2000-01 Status: Data analyses completed, draft report underway	Anaheim Bay and Huntington Harbor	<u>Anaheim Bay:</u> contact and non-contact recreation; navigation; biological habitat of special significance; wildlife habitat; rare, threatened or endangered species habitat; fish spawning; and marine habitat <u>Huntington Harbor:</u> Navigation; contact and non contact recreation; wildlife habitat; rare, threatened or endangered species habitat; fish spawning; and marine habitat	Are aquatic populations , communities protected?
2001-02 Status: Data analyses to begin Oct 2004	Completion of Anaheim Bay, and Huntington Harbor and beginning of sampling work for Lake Elsinore	<u>Lake Elsinore:</u> body contact and non-body contact recreation, warm fresh water habitat, and wildlife habitat	Does the water quality meet the body contact, non body contact , and habitat beneficial uses?
2002-03 Status: Sampling underway	Completion of Lake Elsinore and beginning of Canyon Lake sampling work	<u>Canyon Lake:</u> Municipal water supply, agricultural water supply, ground water recharge, body contact and non-body contact recreation, warm water habitat, and wild life habitat.	Does the water quality meet the municipal water supply beneficial use? Are aquatic populations , communities protected?
2003-04	Completion of	<u>Big Bear Lake:</u> Municipal water supply; agricultural	Does the water

Fiscal Year:	Water Bodies to be Monitored:	Beneficial Uses:	Monitoring Objective:
Status: Big Bear Lake study will not be done due to TMDL efforts underway.	Canyon Lake and beginning of Big Bear Lake sampling work	water supply; ground water recharge; body contact and non-body contact recreation; warm water habitat; rare, threatened or endangered species habitat; and wild life habitat.	quality meet the body contact, non-body contact, and habitat beneficial uses? Does the water quality meet the municipal water supply beneficial use?
2004-05 Status: Stream study to commence April 2005	Completion of Big Bear Lake sampling work, beginning of sampling design for streams in the Santa Ana Region	N/A	N/A
2005-06	Beginning of sampling work in streams	Aquatic habitat, contact and non contact recreation,	Are aquatic populations , communities protected?
2006-07	End of sampling work in streams, beginning of sampling work in Anaheim Bay and Huntington Harbour	See above	
2007-08	Completion of sampling work in Anaheim Bay and Huntington Harbour, beginning of sampling work in Lake Elsinore	See above	
2008-09	Completion of sampling work in Lake Elsinore and beginning of sampling work in Canyon Lake	See above	
2009-10	Completion of sampling work in Canyon Lake beginning of sampling work in Big Bear Lake	See above	
2010-11	Completion of sampling work in Big Bear Lake and beginning of sampling work in streams	See above	

Long-Term Goals and Objectives:

The Santa Ana Region's Ambient Monitoring Program's long-term goals under SWAMP are to:

- Target water bodies for monitoring where water quality information is scant;
- To determine the percent area of a given water body that meets or does not meet beneficial uses by comparing data to numerical objectives or guidelines;
- To provide ambient water quality data to decision makers and to the public;
- To coordinate with other data collection efforts
- To use ambient water quality data to determine the overall conditions of water bodies in the region for inclusion in the 305(b) Report and the 303(d) list;

Monitoring Approach:

The water bodies selected for sampling are those that are included in the 303 (d) List and for which a TMDL is not scheduled in the near future. Once the water bodies are selected, the random sampling monitoring design is used to select the sampling sites. Due to the large number of streams in the region and the little information available on streams, the random sampling approach was utilized to determine the % of streams in the region that support the aquatic life beneficial use. Existing data is reviewed if available prior to selecting the appropriate water quality indicators and field sampling approaches.

Workplan

1. Introduction:

The Santa Ana Region is one of the smallest of the nine regions in the state. Although small, the region's four million residents make it one of the most densely populated regions. The climate of the region is classified as Mediterranean: generally dry in the summer with mild, wet winters. The average annual rainfall in the region is about fifteen inches, most of it occurring between November and March. The two main rivers in the Region are the Santa Ana River and the San Jacinto River. The Santa Ana River cuts through the San Bernardino Mountains and the Santa Ana Mountains and flows down to the ocean. The Santa Ana River is effluent dominated. The Orange County Water District recharges the river's water downstream of Reach 3 into basins for treatment and use as drinking water supply. The San Jacinto River is dry during the dry season, flowing during large storm events. The terminus of the San Jacinto River is Canyon Lake during small storm events and Lake Elsinore during large storm events. Except for coastal streams that empty directly into the ocean, the stream network in the Santa Ana Region is made up of first, second, third and fourth order streams that directly empty into the Santa Ana River or the San Jacinto River.

Due to the vast network and the arid climate, water quality information for the streams in the Santa Ana Region is made up mostly of discharger data from NPDES permits, and volunteer monitoring efforts of selected streams. Due to the variety of number of streams and the scant funding available for stream monitoring, Regional Board worked with staff from EPA at Corvallis to design a monitoring program for streams in the region. The monitoring design is

a randomized sampling design. Fifty sites were randomly selected to cover the streams in the Santa Ana Region.

Once the design was selected, the indicators selected to describe the status of the streams include benthic assessment, physical habitat, grain size, in-stream physical parameters, nutrients and bacteria. This information will be used to pinpoint the percent number of streams that are of concern and require further study. Correlations between physical parameters, physical habitat, nutrient results, and bioassessment results will be done to narrow down the possible causes of impairment.

2. Existing Data Review:

The sampling design for the streams in Region 8 is a randomized sampling design. The statistician provides staff with a list of several potential locations to select as sampling locations. The sampling locations are selected by first determining the accessibility of the location, and whether there is flow. Reconnaissance of each sampling location will take place prior to collecting any environmental measurements or infauna samples.

3. Focus of Work

This study focuses exclusively on determining the percent number of streams in the Santa Ana Region that may be classified as good, fair or poor according to the Southern California Index for Biotic Integrity. Water column data will be correlated with infauna results, and to applicable water quality objectives.

4. Study Design and Objectives

The study design is a random sampling design. The objectives of this monitoring study are:

- Define the extent (percent of streams) that are classified as good, fair or poor according to the Southern California Index of Biotic Integrity.
- Correlate the ambient water quality results of the streams with infauna results.
- Compare ambient water quality data with applicable objectives and determine the range of concentrations found for each indicator measured.

5. Indicators

The indicators selected for this study are benthic macro-invertebrates, nutrients (Nitrogen species, Phosphorus species), stream physical habitat, dissolved oxygen, temperature, TDS, grain size, turbidity, specific conductance, pH, Total Organic Carbon, Dissolved Organic Carbon, BOD, COD, MBAS, and Oil and Grease.

6. Sampling and Analyses Methods

Uniform sampling and analytical methods will be conducted throughout the stream study.

- Water Column Field Measurements:

A YSI 6920 multi-parameter probe will be used to measure pH, dissolved oxygen, temperature, pH, salinity, bottom depth, turbidity, and total suspended solids. The multi-parameter probe will be calibrated the same day as the sampling activities. These measurements will be taken twice each month along the width of the stream.

- Benthic Macro-invertebrate Collections:

The benthic macro-invertebrate collection will be done using the California Bioassessment Protocols developed for EMAP. Physical habitat data will be collected in conjunction with the macro-invertebrates and identified to the genus species level.

7. Responsible Parties

- Santa Ana Regional Water Quality Control Board's Role:

- Assist Cal State Long Beach in obtaining necessary permits to access the sampling sites and collecting samples.
- Obtain the necessary funding to carry out the study.
- Coordinate with Cal State Long Beach during all phases of the study.

- California State University Long Beach:

- Organize field teams of students for fieldwork.
- Train the students for reconnaissance and fieldwork measurements.
- Perform data analyses and write a report on the data each year.
- Obtain the necessary permits to access the sampling sites and collecting samples
- Collect samples per protocols specified by the Department of Fish and Game.
- Ensure that all necessary chain of custody forms are completed prior to surrendering samples to the laboratory

8. Equipment:

9. Chain of Custody and Field Methods

The Regional Board will be responsible for tracking all samples collected during the study. Chain of custody forms will be used to track each sample from the time it is collected to its final destination in the laboratory. The field crew will complete a chain of custody form for each set of samples to be transferred to the laboratory. This form will be signed by the crewmember transferring the samples. Subsequently, the laboratory staff member will sign the chain of custody form. A copy of the chain of custody form will be kept in the Regional Board Water Quality Assessment 2001 File and the original will accompany the samples.

10. Quality Assurance and Quality Control

Quality assurance/quality control (QA/QC) is an important part of any environmental monitoring project. A carefully planned QA/QC program ensures that the data collected are scientifically valid and adequate to meet the goals of the study.

Quality assurance activities for the study include but are not limited to:

- Standardization of sample collection, processing, and analytical methods
- Training workshops for field crews.
- Development of a project specific QAPP that conforms to the SWAMP QAMP

11. Data Management and Data Availability

Field and laboratory data will be reported to the Regional Board in electronic format that is SWAMP compatible.

12. Project Reporting

A water quality assessment report, in draft form, describing the conclusions of the study will be available through the Regional Board's website for review and comment. The final report will address any comments received and will be available to the public through the Regional Board's website.

13. Deliverable Products:

The deliverable for this project will include a report classifying the streams in the region per the Southern California IBI and results and findings from the water column analyses.

14. Sample Collection Dates and Laboratory Reporting:

The sample collection dates will depend on the timeliness of the approval of the contract for this project. The desired sample collection dates are April through July 2005.

15. Budget:

The funds necessary to cover the costs for this study is approximately \$175,000

15. Intra-agency Coordination:

	Monitoring Activities	Coordination Status
State		
NPDES	Stream sampling	Identification of indicators of concern
Basin Planning, TMDL	Stream sampling, lake sampling and Huntington Harbour and Anaheim Bay sampling	Identification of indicators of concern
401 Certifications	Stream sampling	Identification of indicators of concern

17. Interagency Coordination

	Monitoring Activities	Coordination Status
Orange County MWD	Stream sampling	Sharing of stream data and reports
City of Lake Elsinore and City of Canyon Lake	Canyon Lake Sampling and Lake Elsinore sampling	Sharing of lake data and reports
Orange County Env Resources	Stream sampling and Huntington Harbour sampling	Sharing of data and reports.