



Delta Cross Channel Gates Operational Matrix February 2014

State Board Workshop. February 18, 2014

Outline

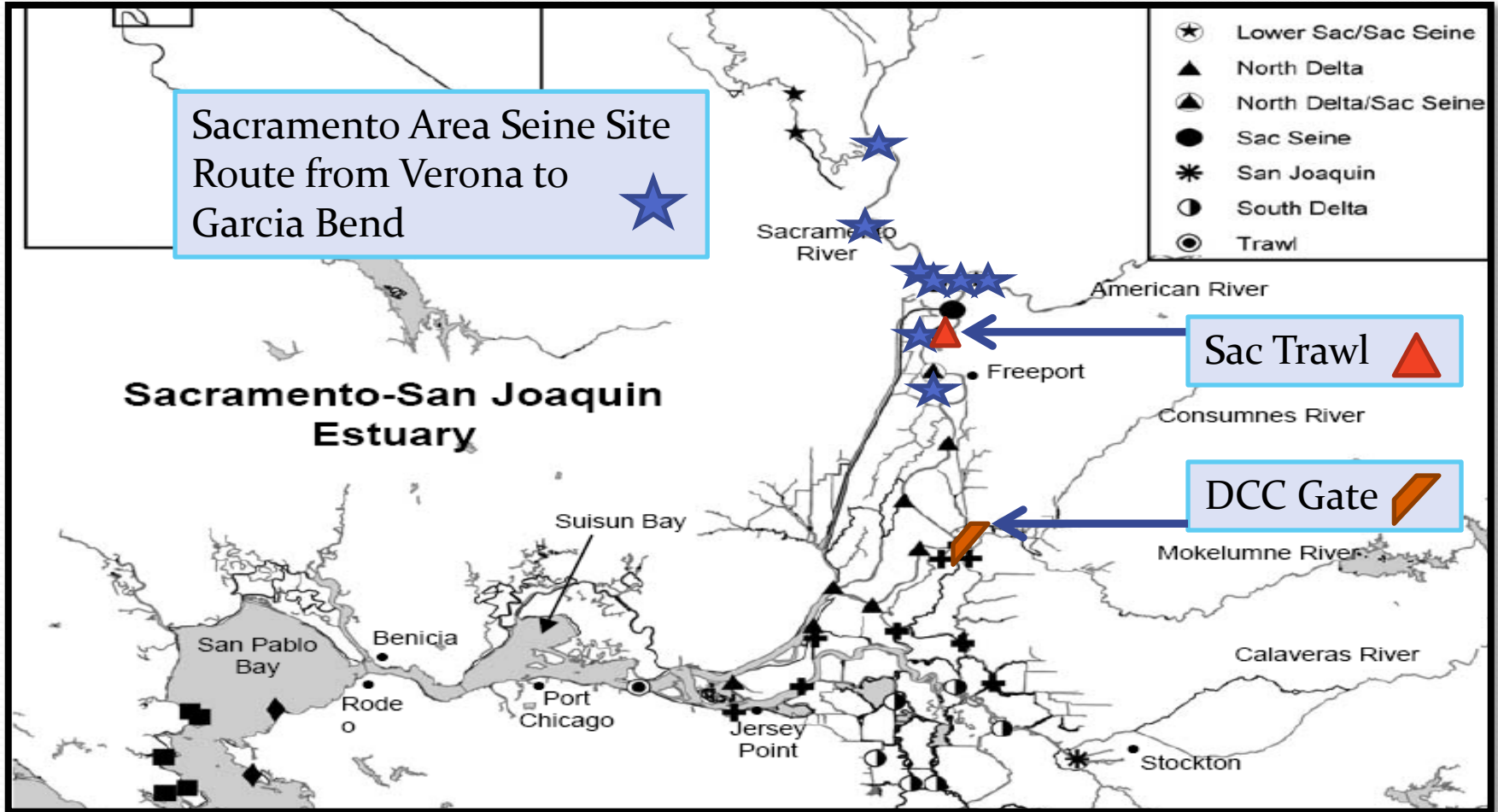
- DCC operations: February triggers
- Sampling locations
- Location & timing of juvenile Winter-run Chinook movements
- Catch indices
- NMFS-DCC management operational matrix.
- Revisions being considered
 - Additional fish species
 - Potential changes to operations & triggers

DCC Operations

February Triggers

- The NMFS operational matrix is focused on the protection of natural origin Winter-run.
- The triggers were considered in January and adopted on January 31 in consultation with NMFS.

Sampling Locations



Location and Timing of juvenile Winter-run Chinook movements

Cumulative % of annual catch of Winter-run and Spring-run sized Chinook salmon
WY 2001 to 2012

Recovery of winter run and spring run sized fish in the Knights Landing RSTs														Percentage occurring before January
	Water Year													
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012		
Water Year type	D	D	AN	BN	BN	W	D	C	D	BN	W	BN		
Date first WR @ KL	11/6/2000	11/16/2001	10/11/2002	10/6/2003	10/29/2004	10/11/2005	10/6/2006	12/12/2007	12/29/2008	10/15/2009	10/11/2010	10/10/2011	100	
25% @ KL	1/19/2001	11/27/2001	12/17/2002	12/9/2003	12/11/2004	12/3/2005	12/15/2006	12/31/2007	1/26/2009	10/28/2009	12/8/2010	1/23/2012	75	
50% @ KL	1/29/2001	12/11/2001	12/22/2002	12/11/2003	12/13/2004	12/6/2005	12/17/2006	1/12/2008	2/24/2009	1/20/2010	12/17/2010	1/25/2012	58	
75% @ KL	2/23/2001	1/4/2002	1/4/2003	12/20/2003	1/5/2005	12/24/2005	12/30/2006	1/28/2008	2/27/2009	1/26/2010	12/23/2010	1/27/2012	58	
100% @ KL	4/25/2001	4/24/2002	4/21/2003	4/5/2004	4/22/2005	4/18/2006	3/13/2007	3/3/2008	4/6/2009	4/16/2010	4/9/2011	4/11/2012	0	
Date first SR @ KL	12/20/2000	11/27/2001	12/16/2002	12/10/2003	12/11/2004	11/14/2005	12/13/2006	10/19/2007	10/27/2008	10/26/2009	12/9/2010	10/24/2011	100	
25% @ KL	2/26/2001	2/22/2002	12/19/2002	12/12/2003	1/4/2005	12/21/2005	12/12/2006	1/9/2008	3/19/2009	4/14/2010 ^a	1/4/2011	3/30/2012	50	
50% @ KL	3/28/2001	4/23/2002 ^a	1/4/2003	12/24/2003	3/31/2005	2/7/2006	3/18/2007	1/13/2008	3/25/2009	4/15/2010 ^a	2/27/2011	4/2/2012	17	
75% @ KL	4/18/2001 ^a	4/25/2002 ^a	4/9/2003	3/22/2004	4/20/2005 ^a	4/19/2006 ^a	4/19/2007 ^a	2/7/2008	4/14/2009 ^a	4/16/2010 ^a	4/7/2011	4/13/2012	0	
100% @ KL	5/14/2001	5/14/2002	5/9/2003	5/12/2004	5/12/2005	5/6/2006	5/14/2007	5/15/2008	5/12/2009	5/17/2010	5/2/2011	5/10/2012	0	
Date CNFH FR release	4/13/2001	4/4/2002	4/18/2003	4/16/2004	4/15/2005	4/14/2006	4/12/2007	4/23/2008	4/9/2009	4/8/2010	4/14/2011	4/19/2012		

Cumulative Percentage Winter-run Chinook salmon catch at Knights Landing RST WY 2009

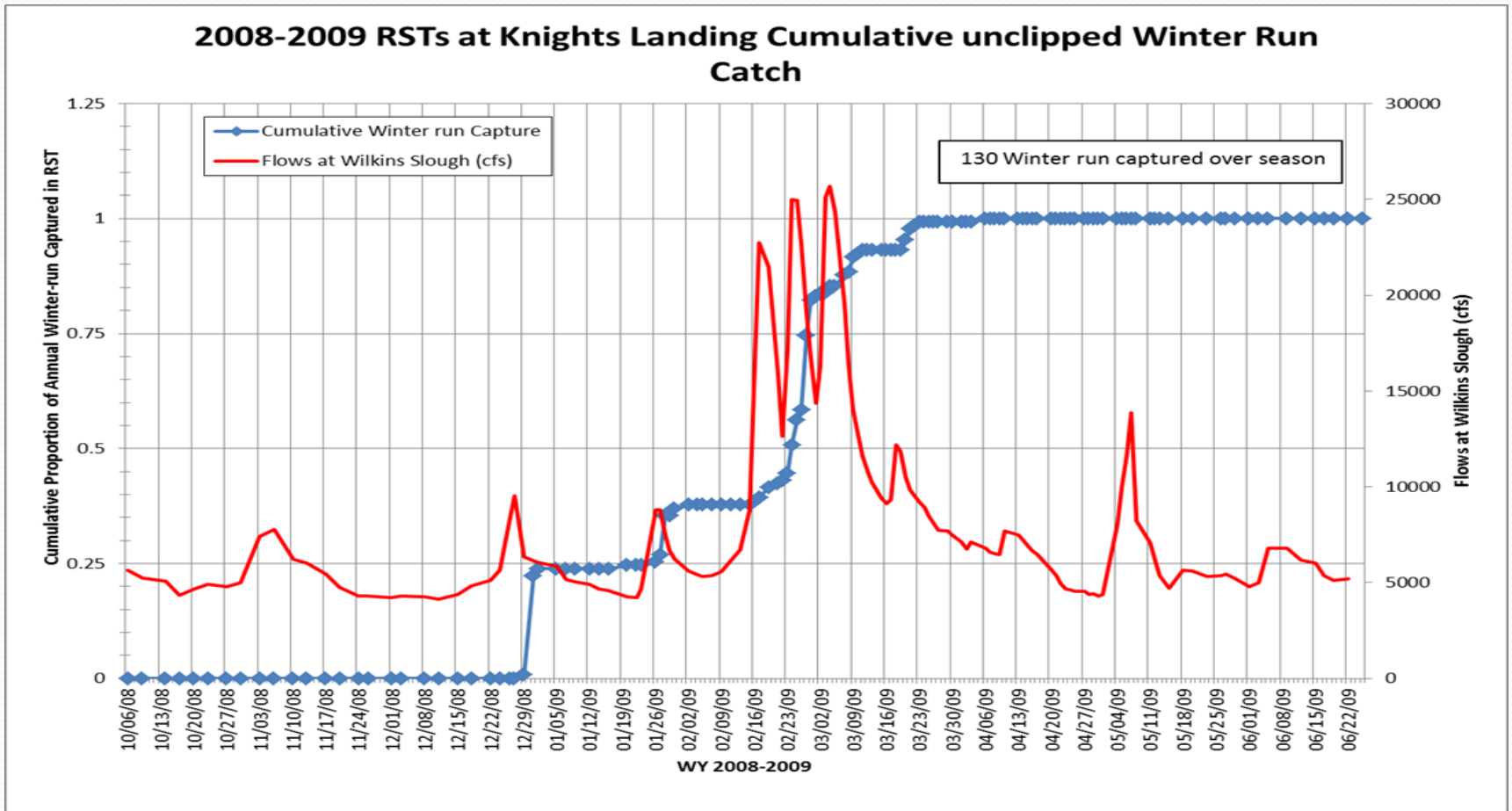
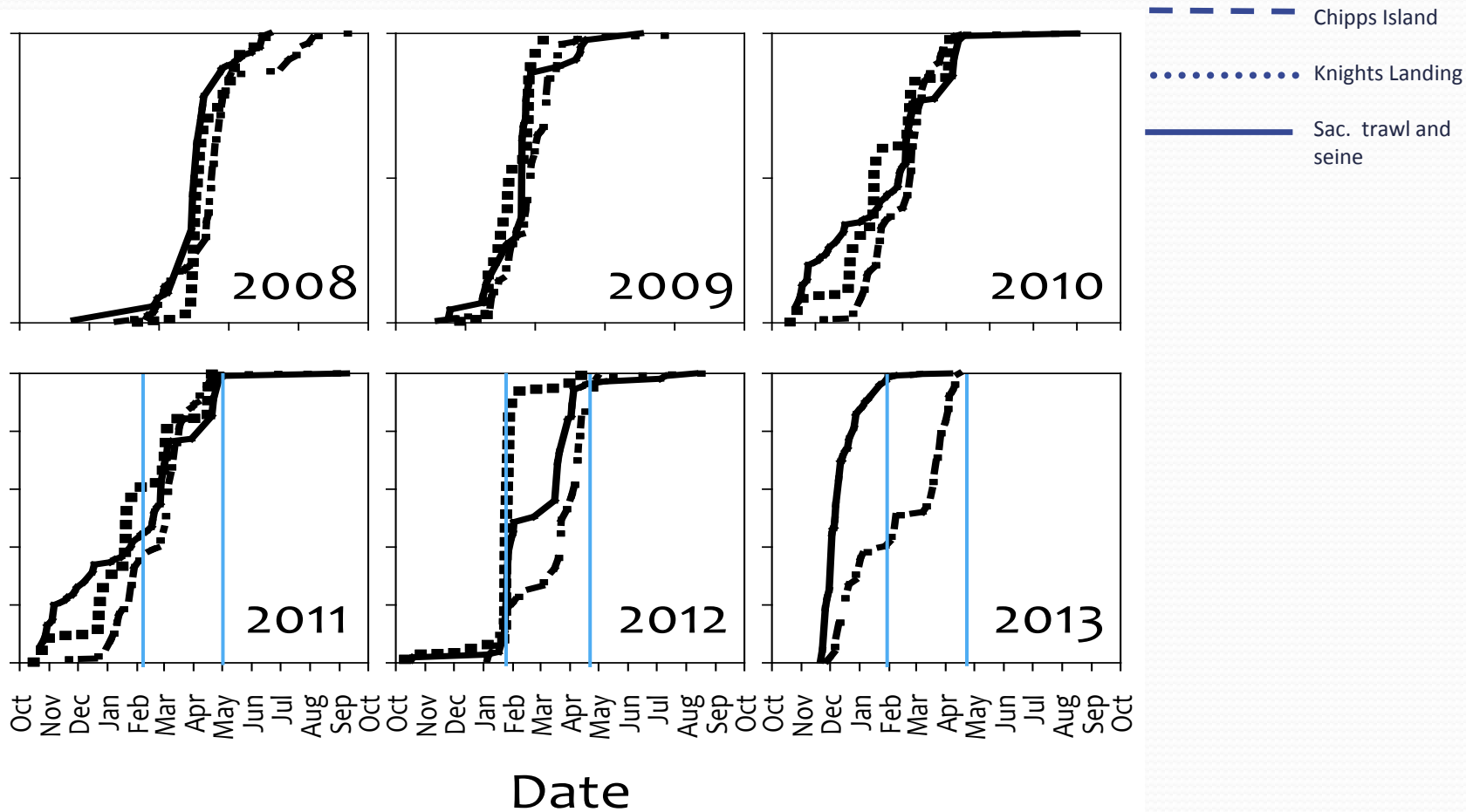


Figure provide Jeff Stuart, NMFS.

Delta Residency

Cumulative Proportion of catch



Catch Indices (CI)

Knights Landing

Sacramento Trawl

Sacramento Seine

Catch indices are estimates of the number of fish that are caught in a day. This estimate is a metric of fish density passing by a sampling location within a given day.

KLCI of Winter-run ~~older~~ juveniles= (# caught/(hours fished/24))

SCI (Seines) of Winter-run ~~older~~ juveniles=

(# caught /# actual hauls) x 8 hauls (Verona, Elkhorn, Sand Cove, Discovery Park, American River, Miller Park, Sherwood Harbor, and Garcia Bend)

SCI (Trawl) of Winter-run ~~older~~ juveniles=

(# caught /# actual tows) x 10 tows (Tows should be 20 min. in duration. To determine the number of 20 min. tows: Sum of tow duration on a given day/20 min.)

Rounding occurs at the end

NMFS-DCC Drought Management Operational Matrix: Alerts

Tisdale Catch Index Rotary Screw Trap (RST) Alert

Catch	Action to be Taken at DCC Gates
CI \geq 3 winter-run	No Action

Wilkins Slough Flow Increase Alert

Flow Increase	Action to be Taken at DCC Gates
Flow increase over base flow by 45% within a 5-day time period.	No Action

NMFS-DCC Drought Management Operational Matrix: Triggers

Knights Landing Catch Index (KLCI) RST

Catch	Action to be Taken at DCC Gates Closures to occur within 24 hours of meeting trigger criteria.
Catch Index \geq 3 (Low trigger)	Closed for 4 consecutive days.
Catch Index \geq 5 (High trigger)	Closed for 7 consecutive days.

Sacramento Catch Index (SCI)

Catch	Action to be Taken at DCC Gates Closures to occur within 24 hours of meeting trigger criteria.
Catch Index = 0	Open
Catch Index = 1-2 (beach seine or trawl)	Diurnal operations.
Catch Index $>$ 2 (beach seine) but Catch Index for trawl = 0	Diurnal operations.

Winter-run Chinook salmon Standardized Catch for KL RST WY 2009

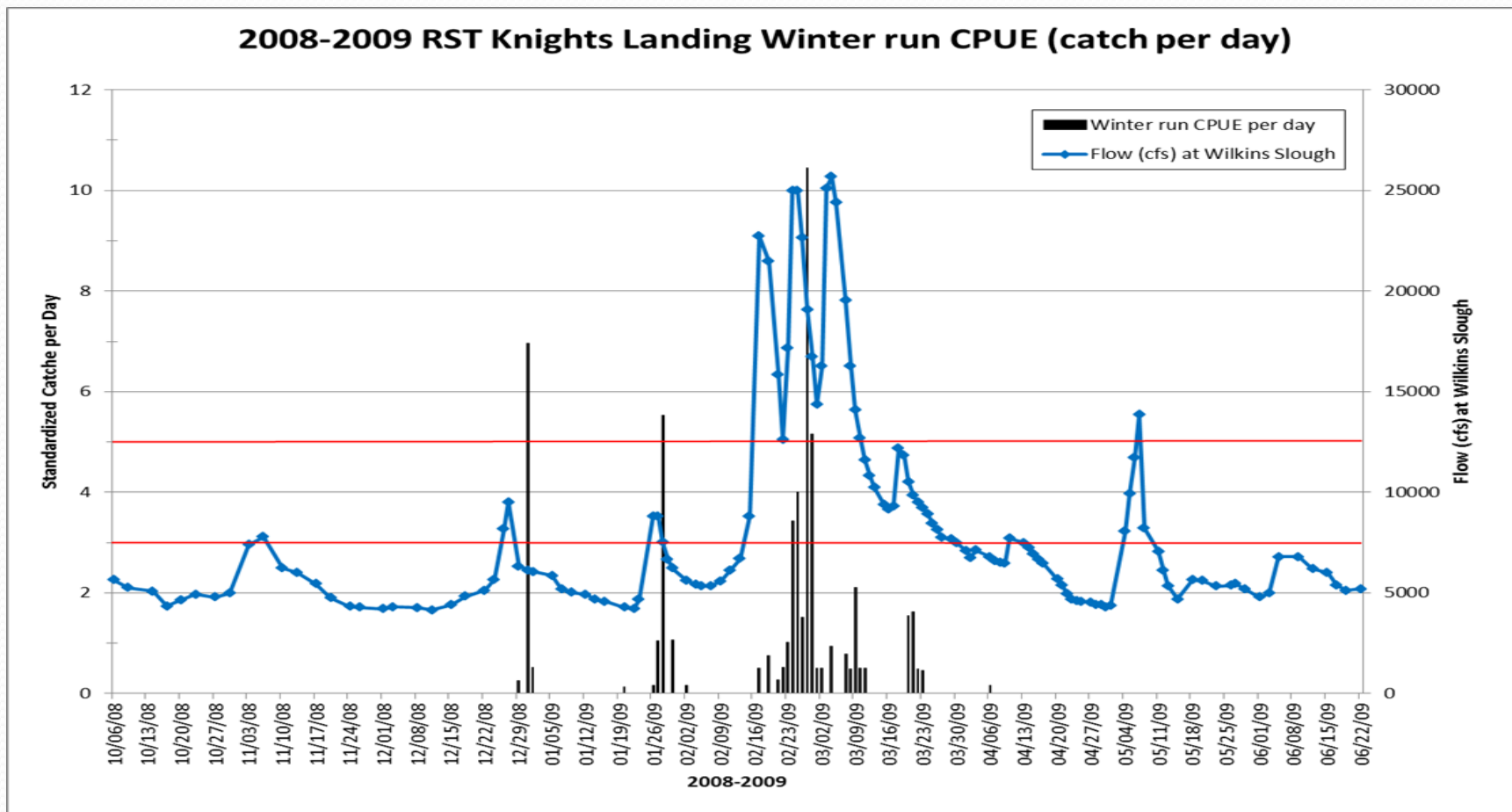


Figure provided by Jeff Stuart, NMFS

Increased Monitoring Efforts

Station	Frequency ^R	Frequency ^M	Agency Lead	Agency Alt.
KCL	7 (12)	7 (24)	DFW	DWR
SCI Trawl	3	5-7	USFWS	DWR
SCI Seine	3	5-7	USFWS	DWR

- Acoustic receiver equipment has been deployed upstream, within, and downstream of the DCC.
- Agencies have been working to modify current take permits in order to continue with not only the routine, but the increased sampling, which does expose more fish to take.

NMFS-DCC Drought Management Operational Matrix: DCC Diurnal Operations

Operational window	Day (6am-6pm window) approximately up to 6 hour window for opening DCC gates within 12 hour diurnal period.
Day	Period of operations for opening the DCC gates will occur during daylight periods. Periods of gate openings shall avoid crepuscular periods.
Night	This is a less optimal period of DCC gate operations for fish protection.

Revisions Being Considered

- The addition of hatchery Winter-run juveniles and a change from Winter-run to older juveniles.
 - “Juvenile Chinook salmon at or above the minimum Winter-run size based on the length-at-date model used at a particular sampling location, and below the maximum size considered by the length-at-date model, on a given sampling date, are considered older juveniles.”
 - Taken from NMFS RPA Action IV.3 Clarification from 3/19/13 DOSS Notes
- Potential changes to operations and triggers.
 - Additional DCC gate operation scenarios and clarifications.
 - Development of physical data for use as potential off-ramp criteria.

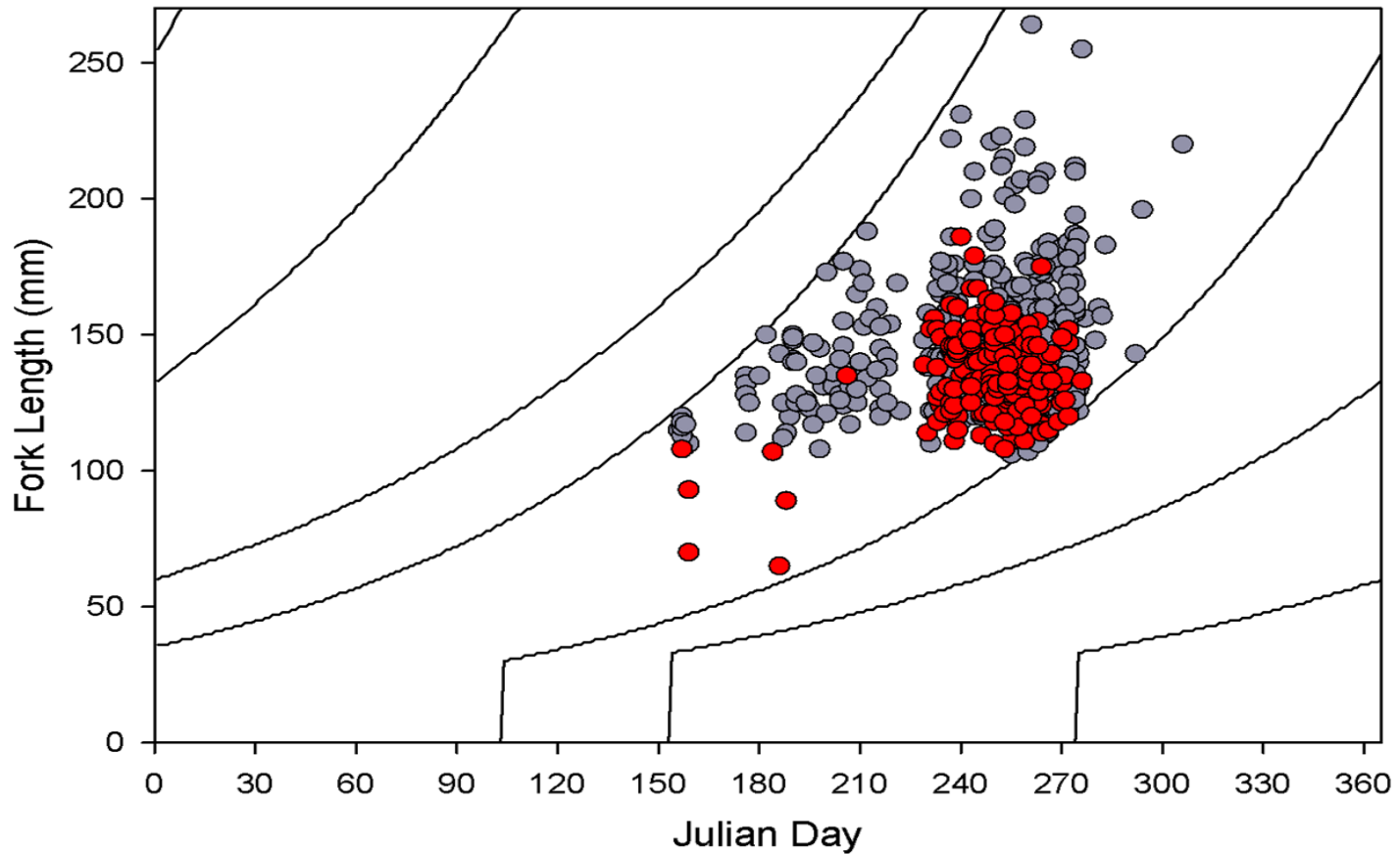
Acknowledgments

- The DOSS DCC Drought Operation technical sub-team. Garwin Yip¹, Jeff Stuart¹, Colin Purdy², Krystal Acierto², Josh Israel³
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- 1 National Marine Fisheries Service
 - 2 California Department of Fish and Wildlife
 - 3 United States Bureau of Reclamation
 - 4 California Department of Water Resources
 - 5 United States Fish & Wildlife Service



Extra Slides

Are winter run sized fish truly winter-run?



Red Bluff Diversion Dam Passage of Juvenile Older Chinook Salmon and Associated Environmental Data

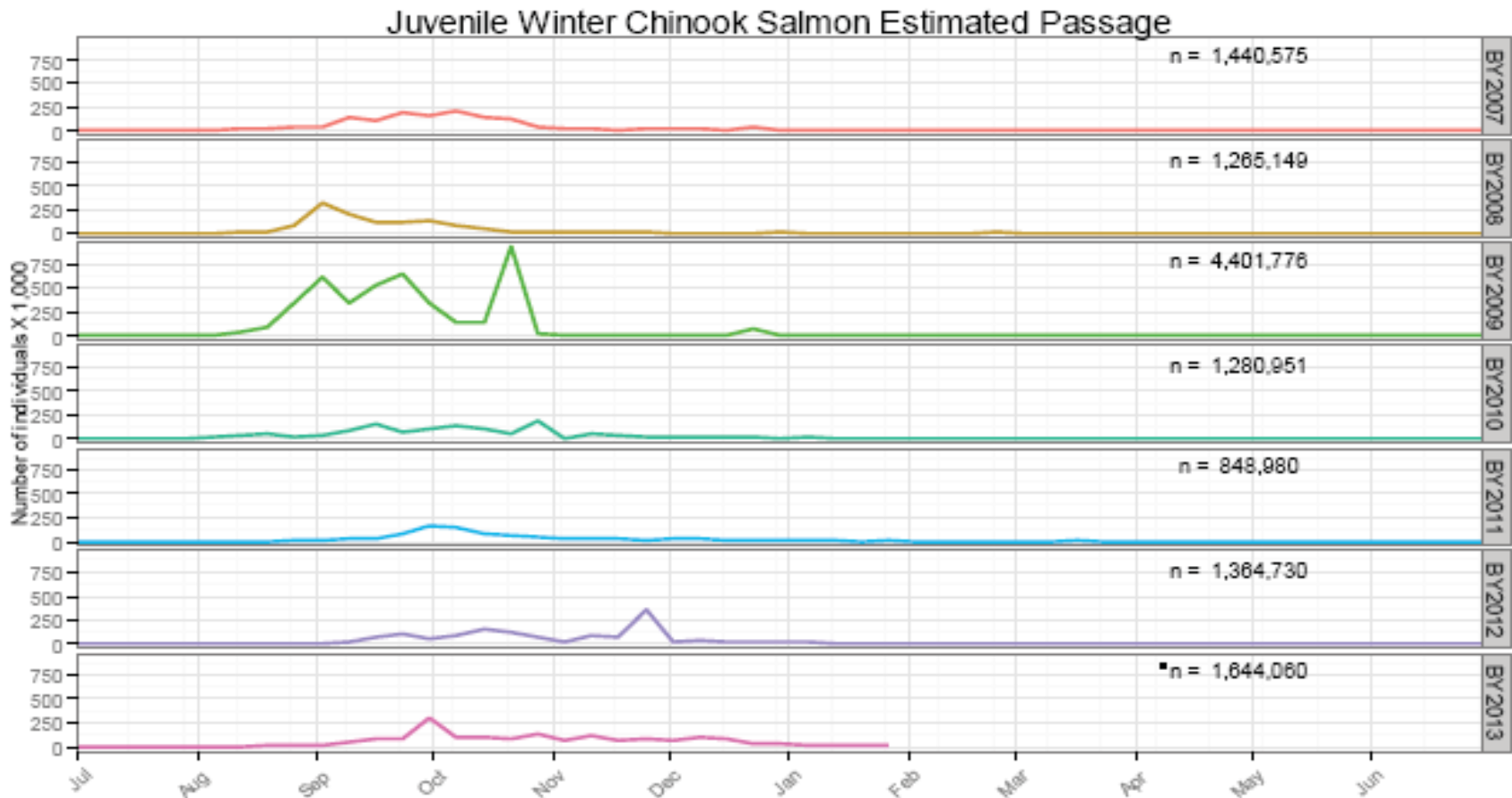


Figure supplied by DWR to DOSS on January 27, 2014.