

FISH COMMUNITY AND DREDGE ENTRAINMENT MONITORING IN THE FEDERAL NAVIGATION CHANNELS IN CALIFORNIA'S SACRAMENTO AND SAN JOAQUIN RIVER DELTA AND PORT OF STOCKTON

Presentation for WEDA XXXIV Technical Conference & TAMU 45 Dredging Seminar

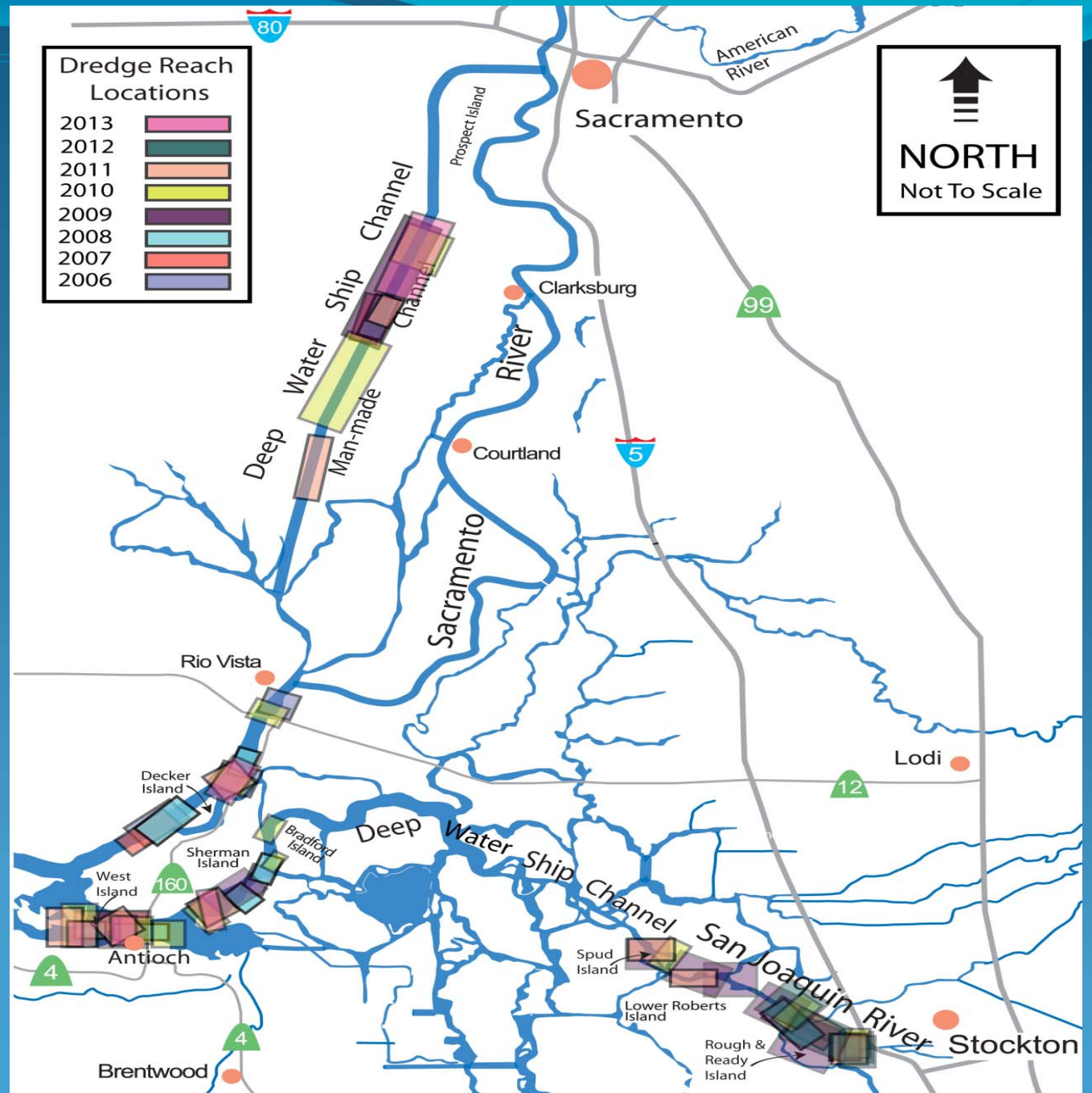
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Cutter Head Dredge

Map of SRDWSC and SDWSC dredge reaches from 2006 – 2013



The monitoring methods were selected based on the need to:

Ensure compliance with applicable environmental laws and regulations including section 7 of the ESA and the clean water act.

Quantify the level of incidental take of special-status fish species.

Assess linkages between the fish species around the dredge and the numbers and types of species entrained by the dredge.

Provide feedback to USACE, NMFS, other (regulatory) agencies and Ports allowing them to assess and implement adaptive strategies designed to diminish negative effects of the annual maintenance dredging in the SRDWSC, SDWSC and Port of Stockton.



USACE Fish Entrainment Screen



USACE Fish Entrainment Screen



USACE Fish Entrainment Screen



Port of Stockton Fish Entrainment Screen



Port of Stockton Fish Entrainment Screen



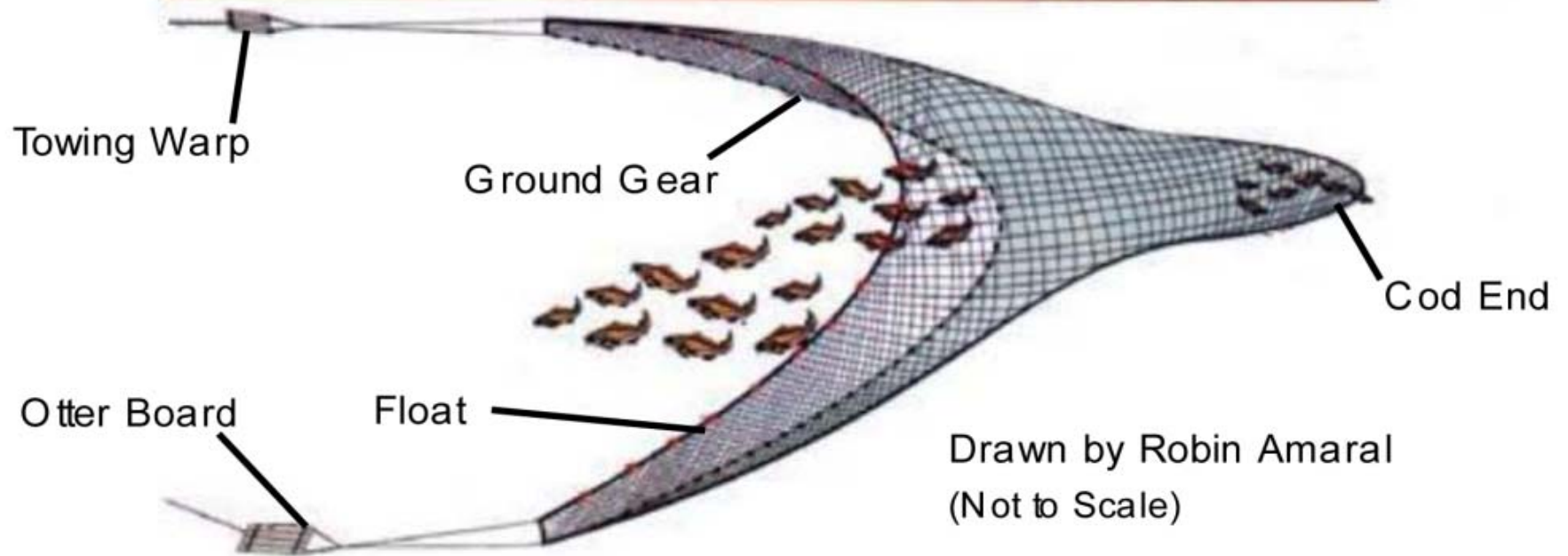
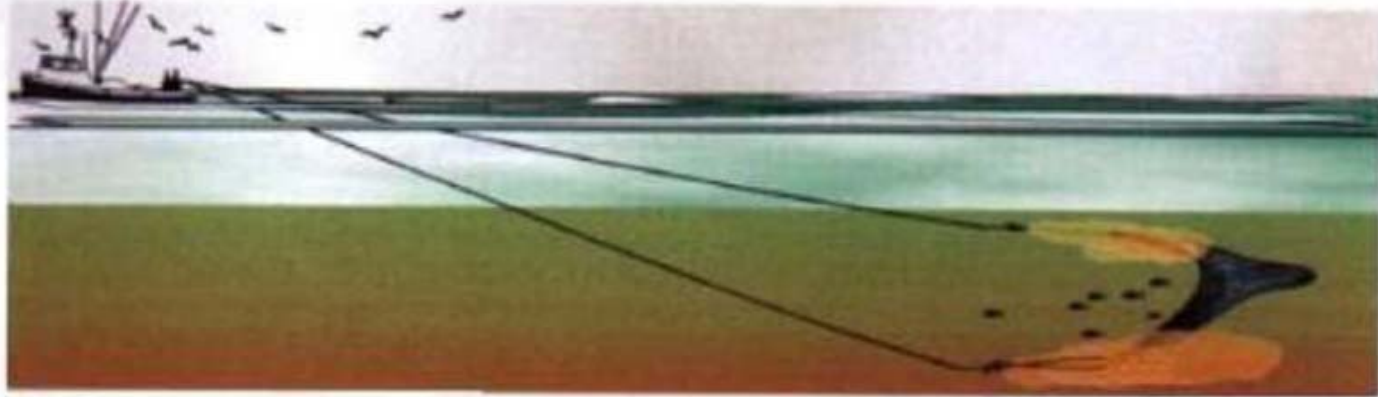
Port of Stockton Fish Entrainment Screen



Port of Stockton Fish Entrainment Screen



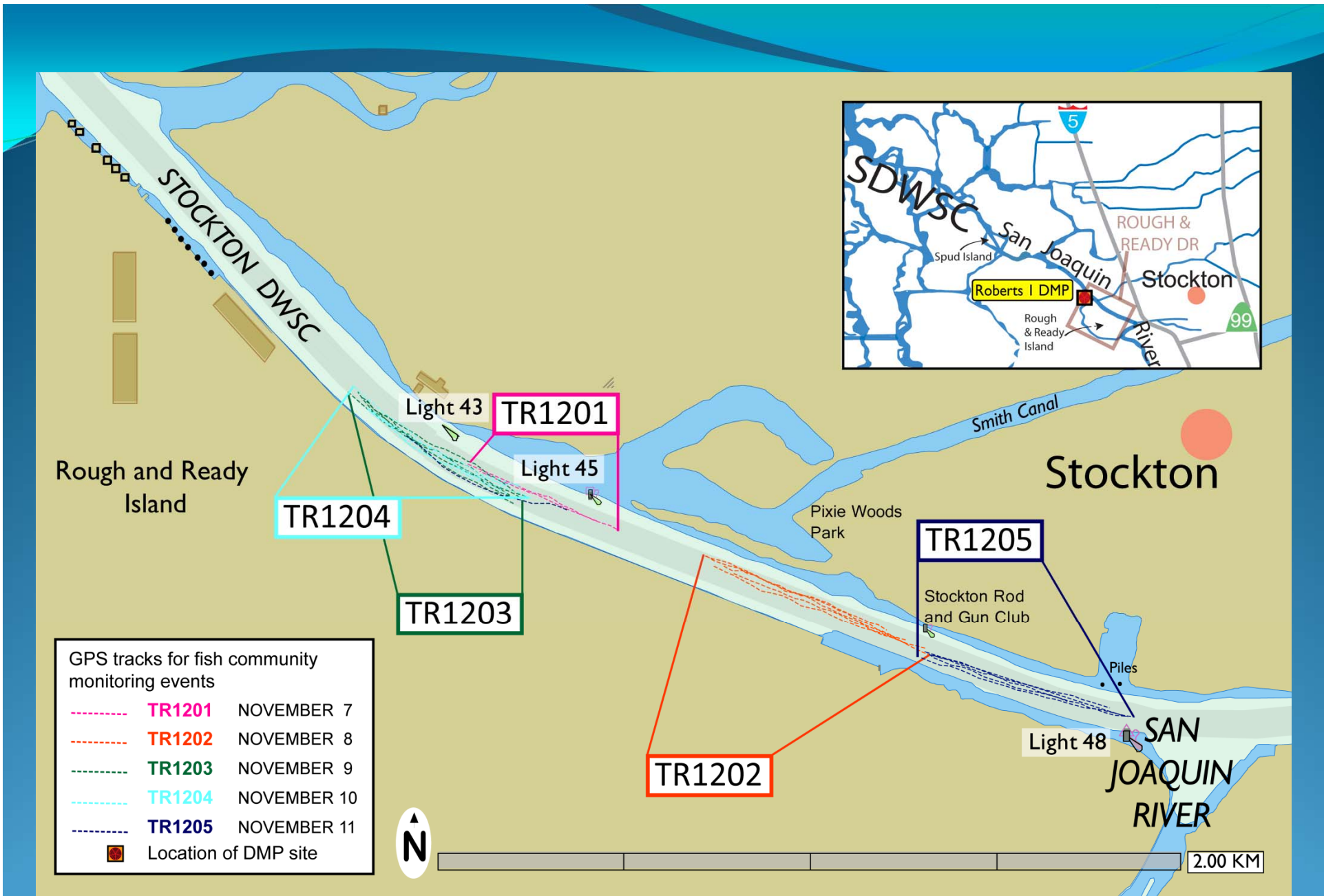
Valve for Port of Stockton Fish Entrainment Screen



Otter Trawl



Research Vessel



Series of trawl logs from 2012

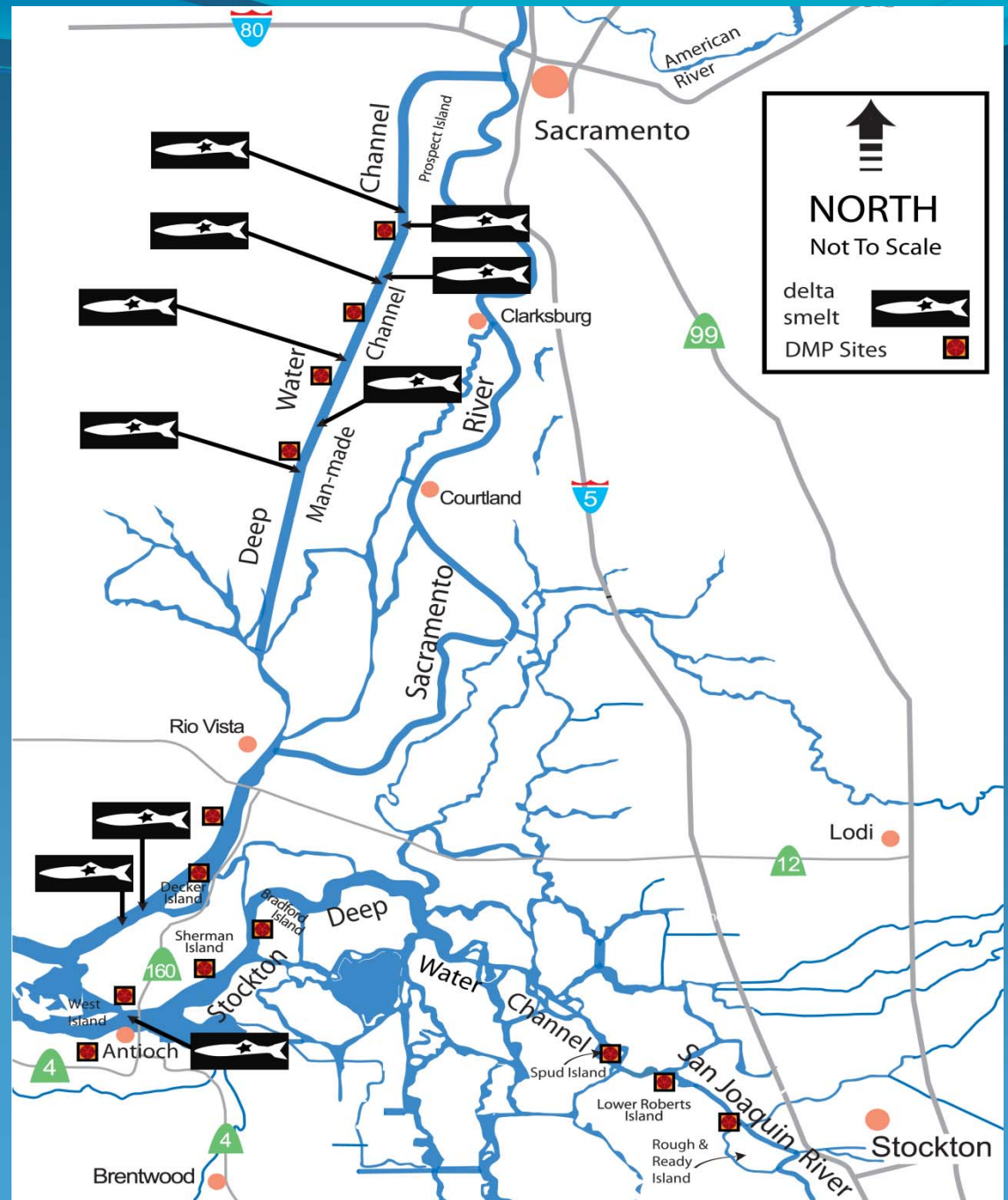


Reclamation Photograph by René Reyes



delta smelt *Hypomesus transpacificus* (adult)

SRDWSC and SDWSC locations where delta smelt were encountered during monitoring from 2006 – 2013.





Reclamation Photograph by René Reyes

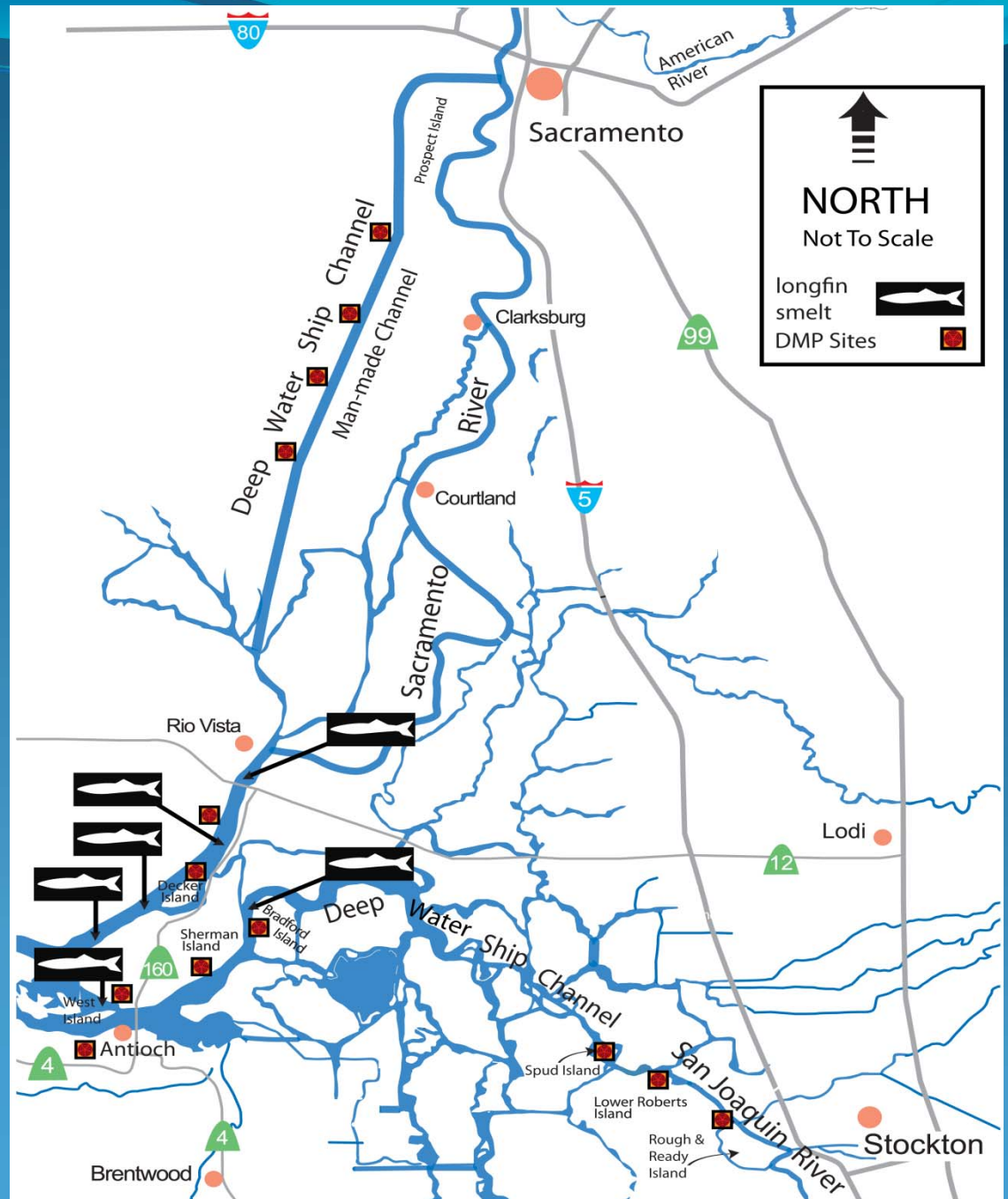


longfin smelt *Thaleichthys pacificus* (adult)



longfin smelt (juveniles, San Francisco Bay)

SRDWSC and SDWSC locations where longfin smelt were encountered during monitoring from 2006 – 2013.





white sturgeon *Acipenser transmontanus* (sub-adult)

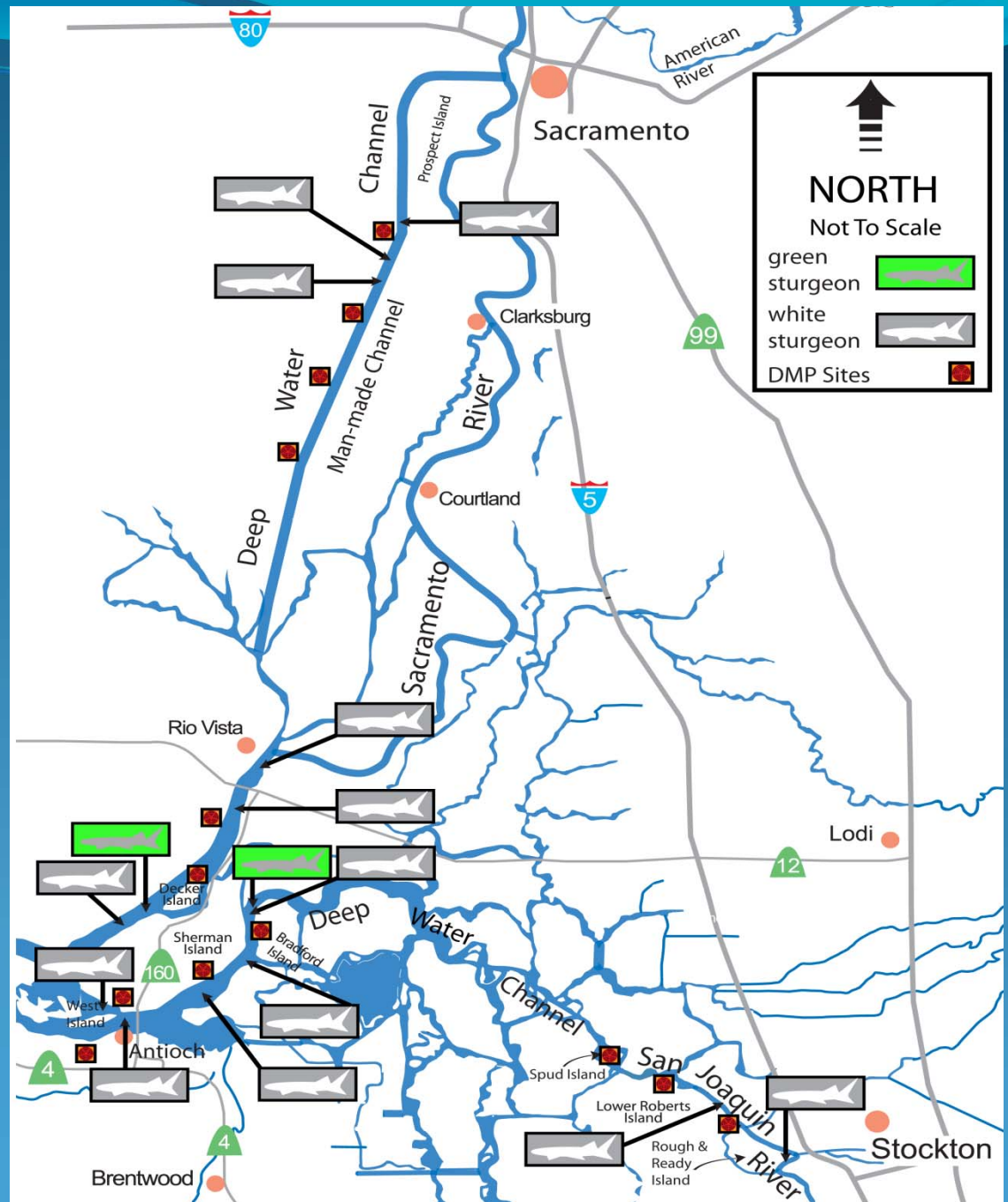


white sturgeon (juvenile)



green sturgeon *Acipenser medirostris* (juvenile)

SRDWSC and SDWSC locations where white and green sturgeon were encountered during monitoring from 2006 – 2013.





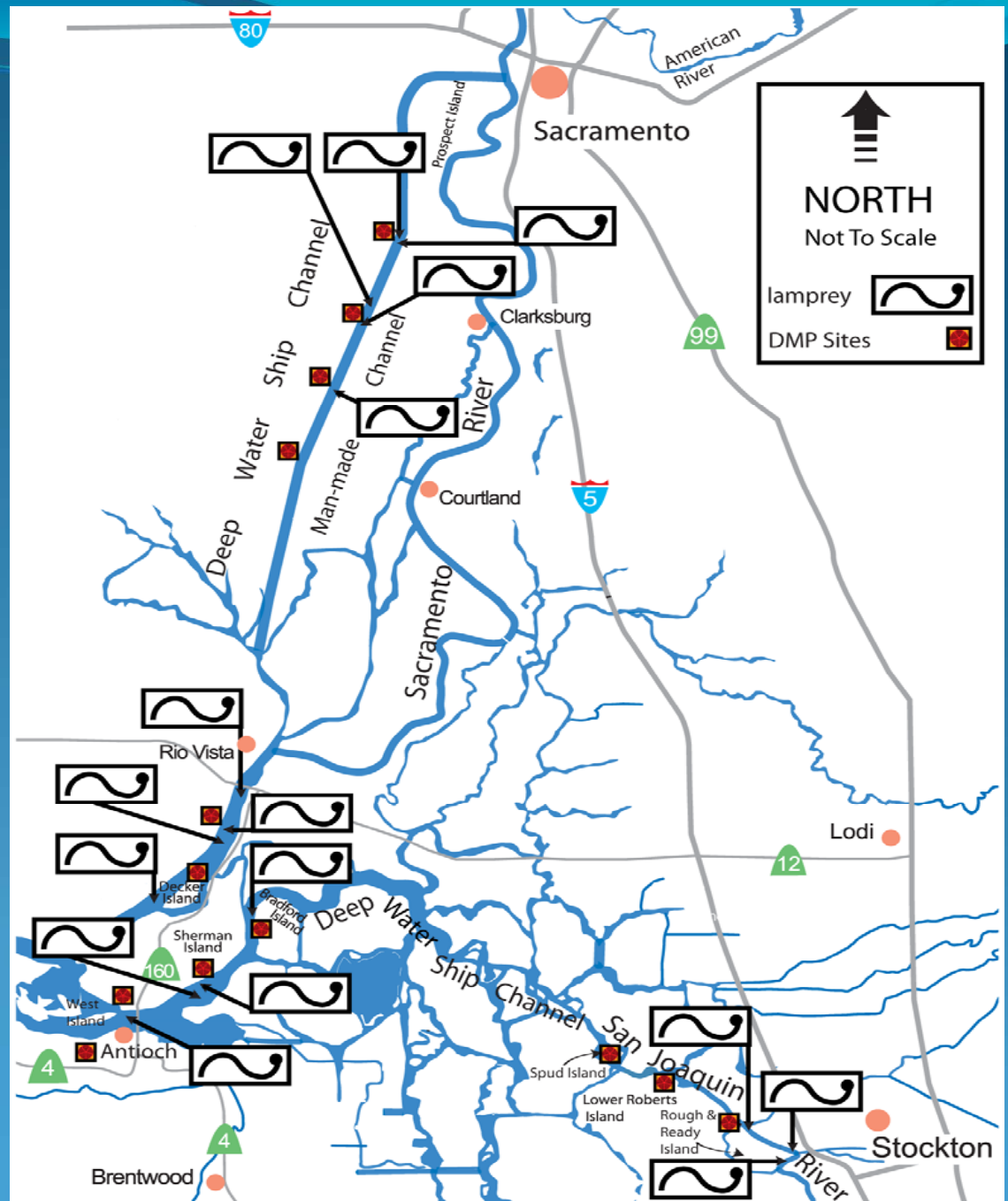
river lamprey *Lampetra entosphenus* (adult)

Photograph by David Rogowski



river lamprey (macrophthalmia stage)

SRDWSC and SDWSC locations where lampreys were encountered during monitoring from 2006 – 2013.



Fish encountered during fish community and entrainment monitoring (TR and ES) in the SRDWSC and SDWSC 2006 – 2013.

•Prior to 2009, lamprey species were lumped. Since then, only a single Pacific lamprey has been encountered; all others have been identified as river lamprey.

** The adult Chinook salmon was dead prior to encounter during fish community monitoring.

ES Rank	% ES Fish	TR Rank	% TR Fish	nES	nTR	Common Name	Origin	Demersal/Pelagic
1	56.48	8	0.62	1,198	275	shimofuri goby	Introduced	Demersal
2	12.82	5	5.16	272	2,301	channel catfish	Introduced	Demersal
3	11.17	23	0.03	237	13	lamprey, species undet. *	Native	Demersal
4	3.77	--	--	80	--	river lamprey	Native	Demersal
5	3.2	3	12.13	68	5,412	striped bass	Introduced	Pelagic
6	2.68	9	0.47	57	210	yellowfin goby	Introduced	Demersal
7	2.21	14	0.23	47	101	Shokihaze goby	Introduced	Demersal
8	1.7	1	48.2	36	21,508	white catfish	Introduced	Demersal
9	1.41	20	0.09	30	42	prickly sculpin	Native	Demersal
10	1.27	7	0.84	27	374	wakasagi	Introduced	Pelagic
11	0.94	2	20.77	20	9,266	threadfin shad	Introduced	Pelagic
12	0.71	17	0.103	15	46	brown bullhead	Introduced	Demersal
13	0.61	4	7.36	13	3,285	American shad	Introduced	Pelagic
14	0.28	18	0.101	6	45	delta smelt	Native	Pelagic
15	0.19	24	0.02	4	9	Pacific staghorn sculpin	Native	Demersal
16	0.14	16	0.16	3	71	bluegill	Introduced	Pelagic
17	0.09	26	0.02	2	9	bigscale logperch	Introduced	Demersal
17	0.09	19	0.096	2	43	common carp	Introduced	Demersal
17	0.09	21	0.062	2	28	warmouth	Introduced	Pelagic
20	0.05	10	0.39	1	175	Sacramento splittail	Native	Pelagic
20	0.05	11	0.29	1	128	white sturgeon	Native	Demersal
--	--	6	2.06	--	918	longfin smelt	Native	Pelagic
--	--	12	0.26	--	118	redeer sunfish	Introduced	Pelagic
--	--	13	0.24	--	107	starry flounder	Native	Demersal
--	--	15	0.19	--	85	tule perch	Native	Pelagic
--	--	22	0.038	--	17	blue catfish	Introduced	Demersal
--	--	25	0.016	--	7	black crappie	Introduced	Pelagic
--	--	26	0.011	--	5	unidentified goby	Introduced	Demersal
--	--	27	0.009	--	4	Sacramento blackfish	Native	Pelagic
--	--	27	0.009	--	4	green sturgeon	Native	Demersal
--	--	29	0.007	--	3	Sacramento pikeminnow	Native	Pelagic
--	--	29	0.007	--	3	white crappie	Introduced	Pelagic
--	--	31	0.002	--	1	Chinook salmon **	Native	Pelagic
--	--	31	0.002	--	1	golden shiner	Introduced	Pelagic
--	--	31	0.002	--	1	largemouth bass	Introduced	Pelagic
--	--	31	0.002	--	1	Mississippi silverside	Introduced	Pelagic
Total				2,212	44,616			

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