



Ten Years of Fish Community and Dredge Entrainment Monitoring
of the Federal Navigation Channels in California's Sacramento and
San Joaquin River Delta and at the Port of Stockton

Presentation for WEDA Pacific Chapter 2015 Annual Meeting

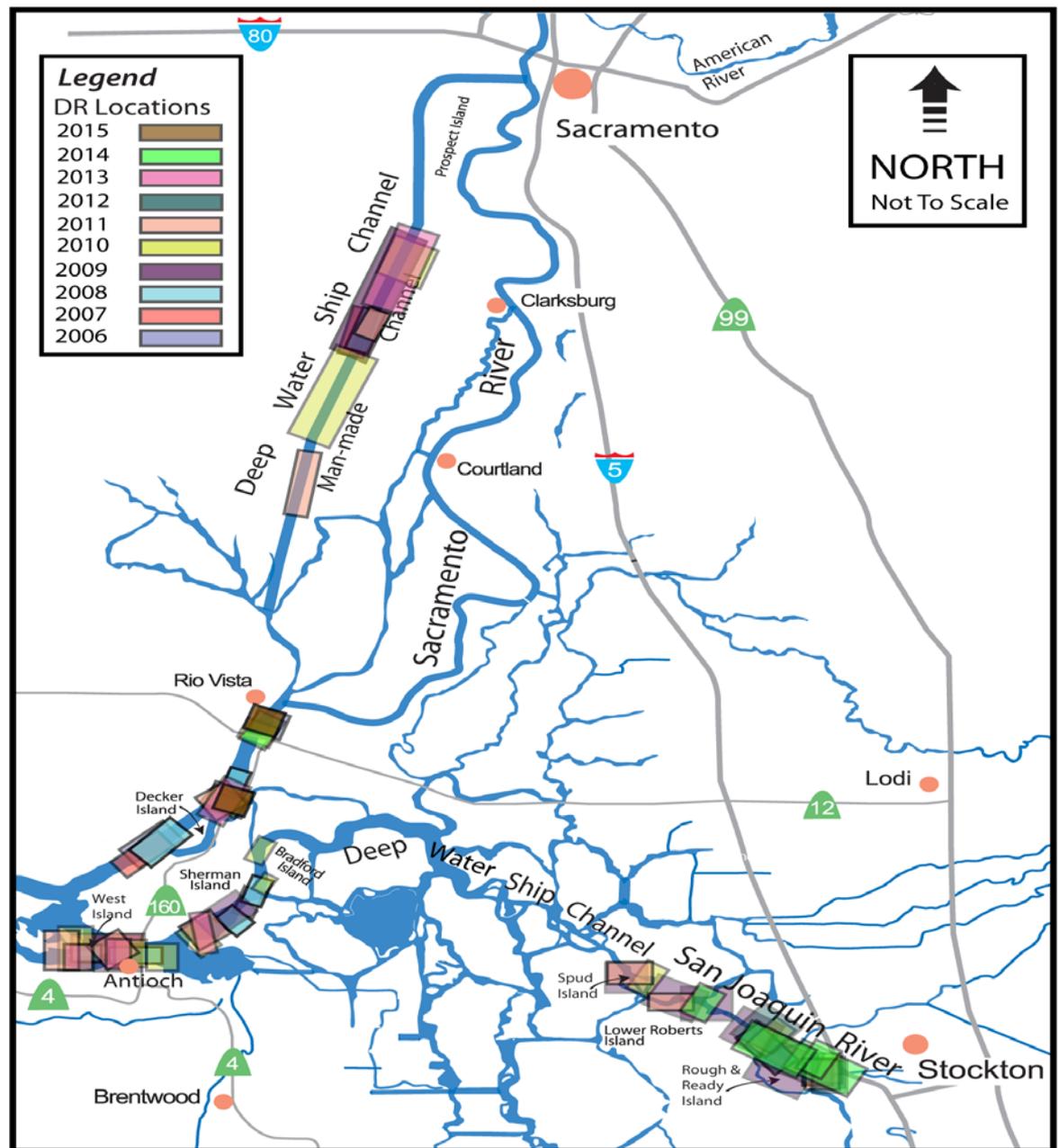
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And
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Cutter Head Dredge

Map of SRDWSC and SDWSC dredge reaches from 2006 – 2015



Regional Map of the Sacramento - San Joaquin Delta, California
(Adapted From USACE - SR District, LTMS Program Map)



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, USFWS, CDFW and 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



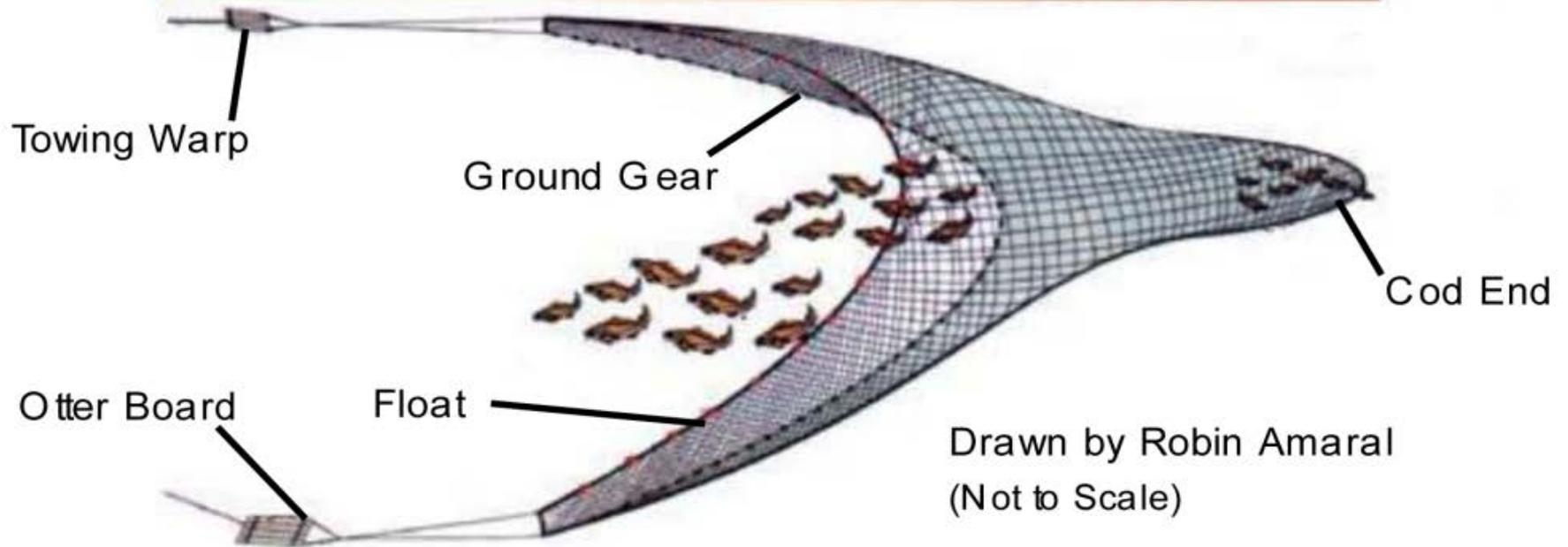
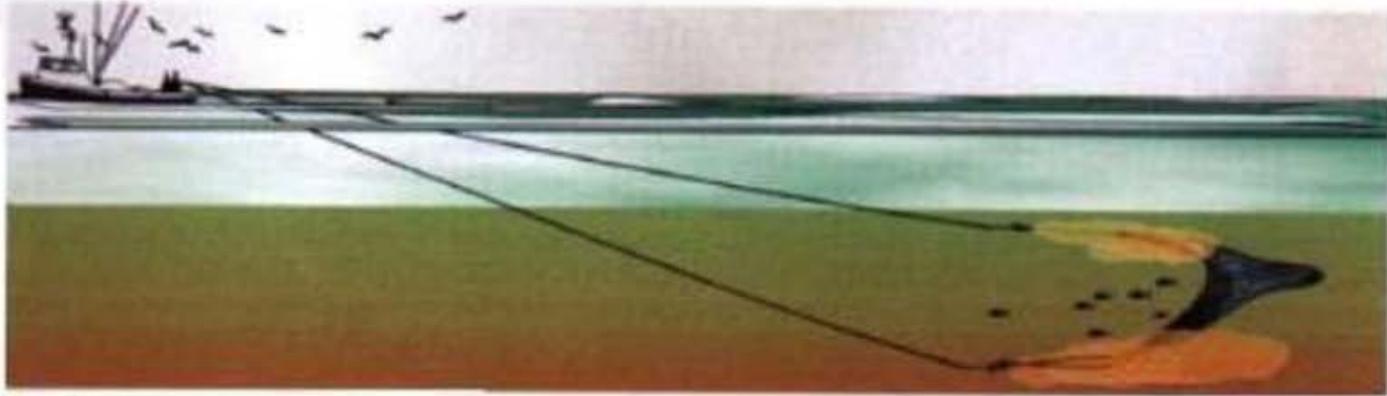
Port of Stockton Fish Entrainment Screen



Port of Stockton Fish Entrainment Screen



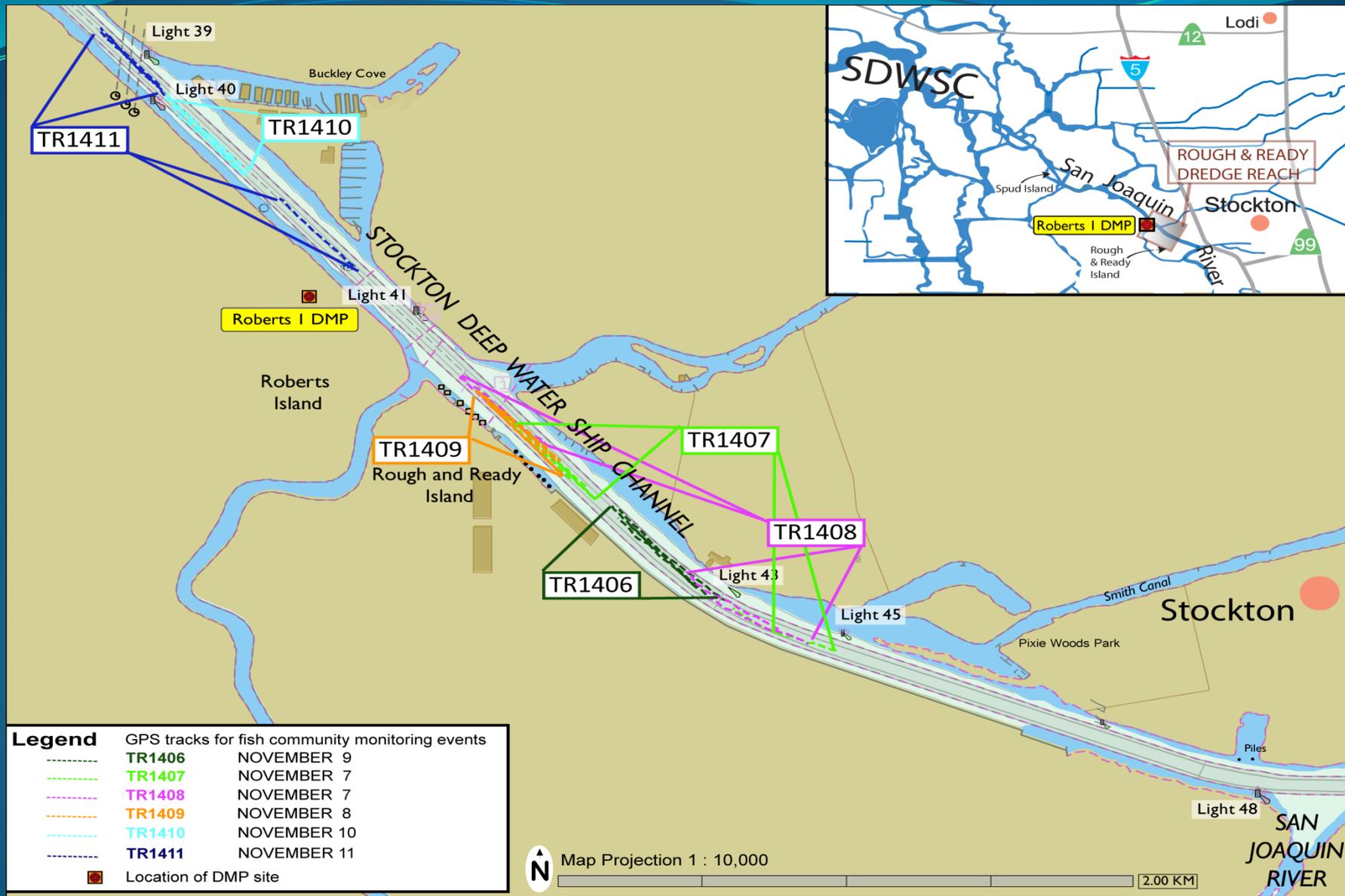
Valve for Port of Stockton Fish Entrainment Screen



Otter Trawl



Research Vessel



Series of trawl logs from 2014

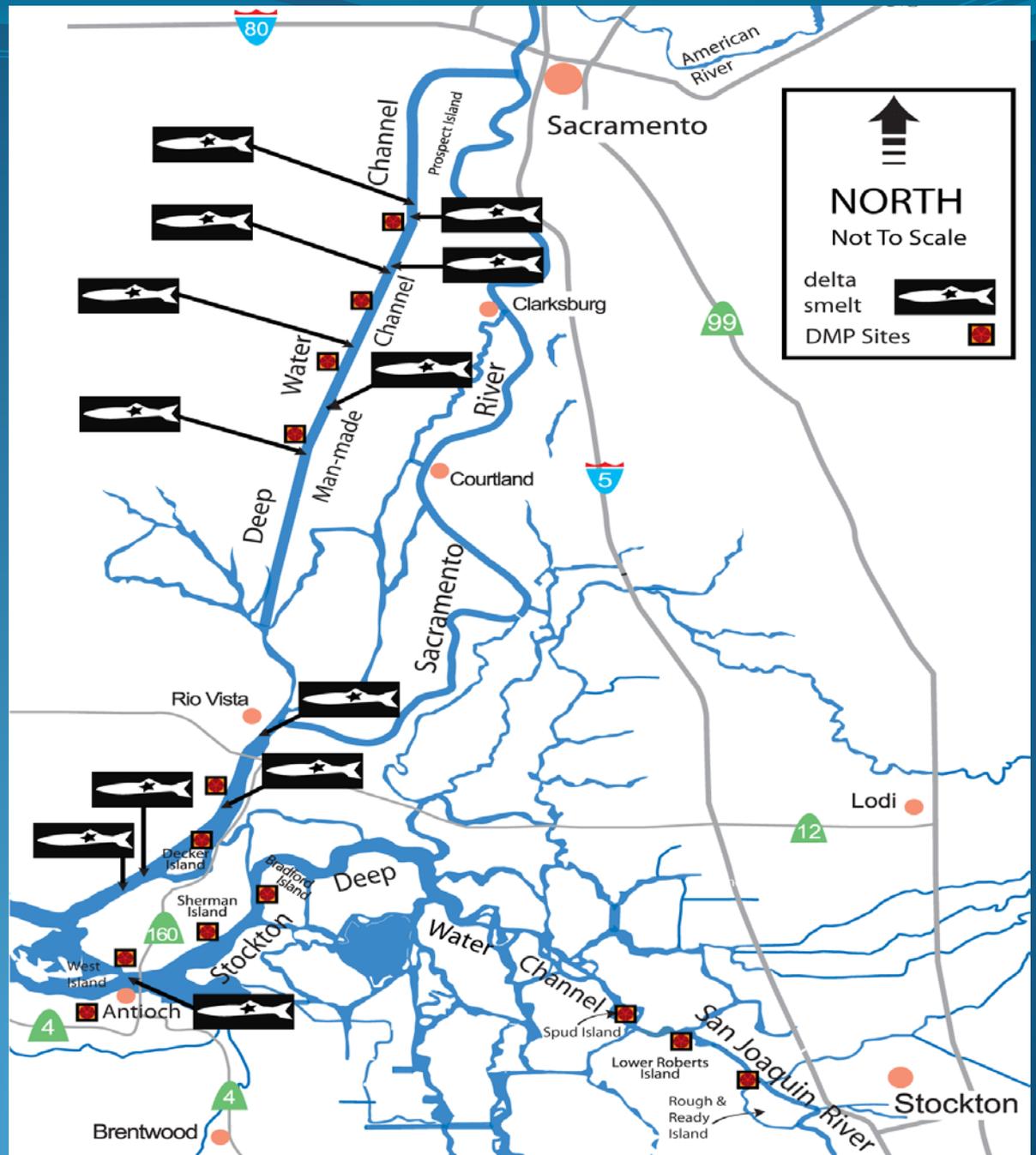


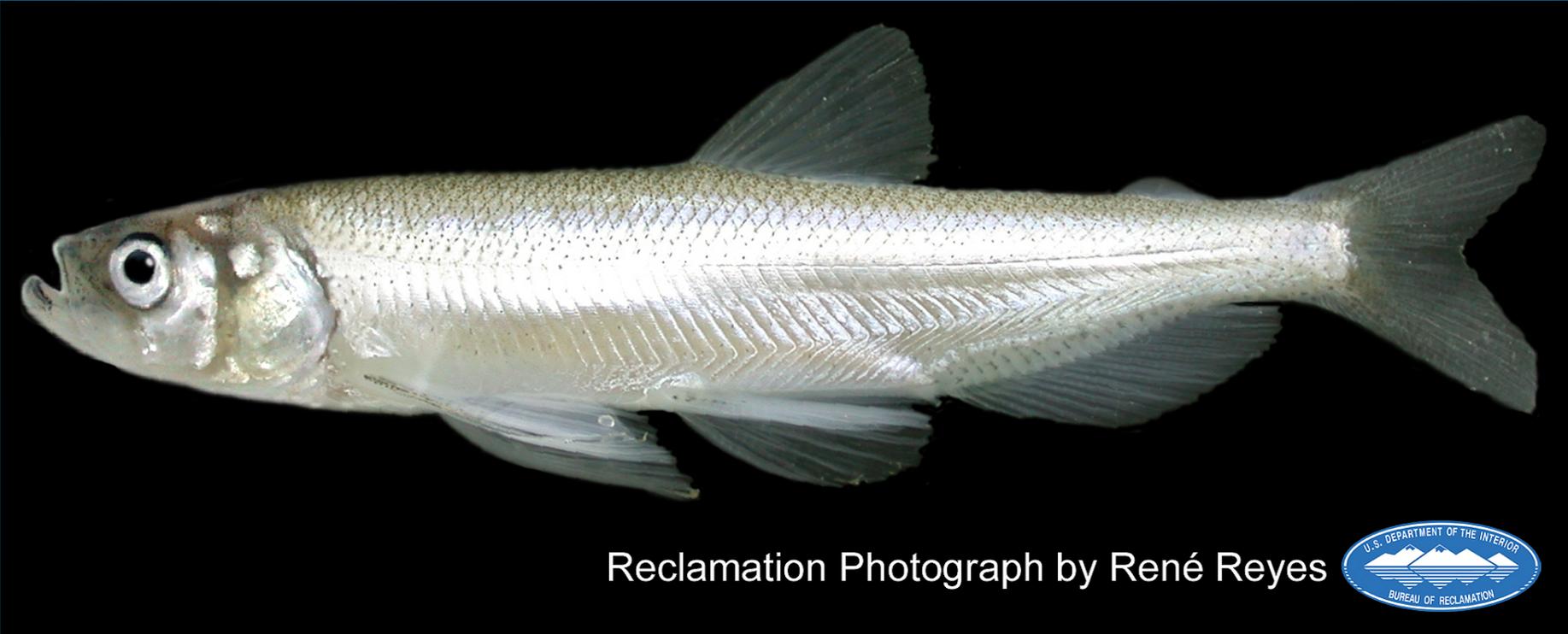
Reclamation Photograph by René Reyes



delta smelt *Hypomesus transpacificus* (adult)

SRDWSC and SDWSC locations where delta smelt were encountered during monitoring from 2006 – 2015.





Reclamation Photograph by René Reyes

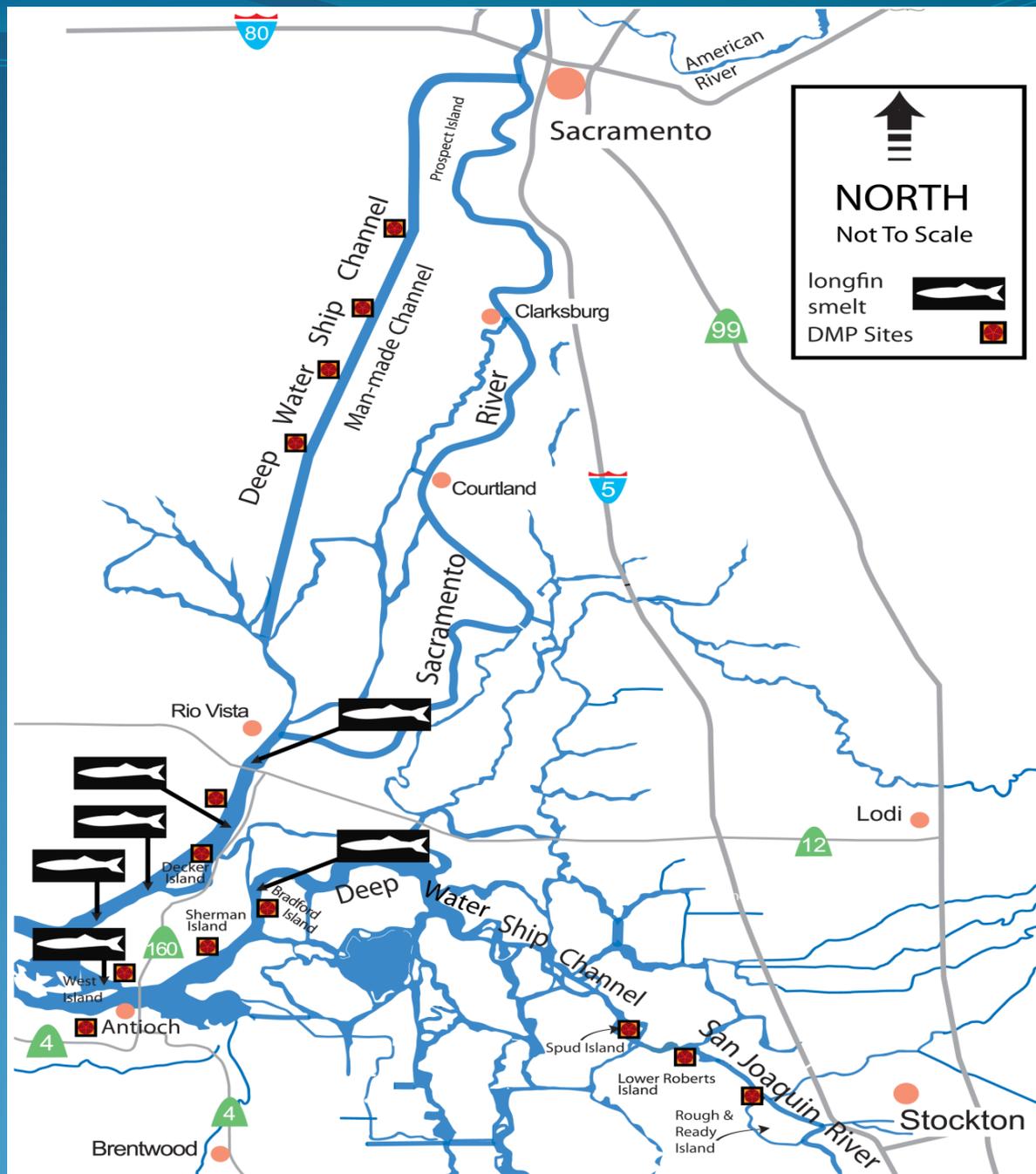


longfin smelt *Thaleichthys pacificus* (adult)



longfin smelt (juveniles, San Francisco Bay)

SRDWSC and SDWSC locations where longfin smelt were encountered during monitoring from 2006 – 2015.





white sturgeon *Acipenser transmontanus* (sub-adult)

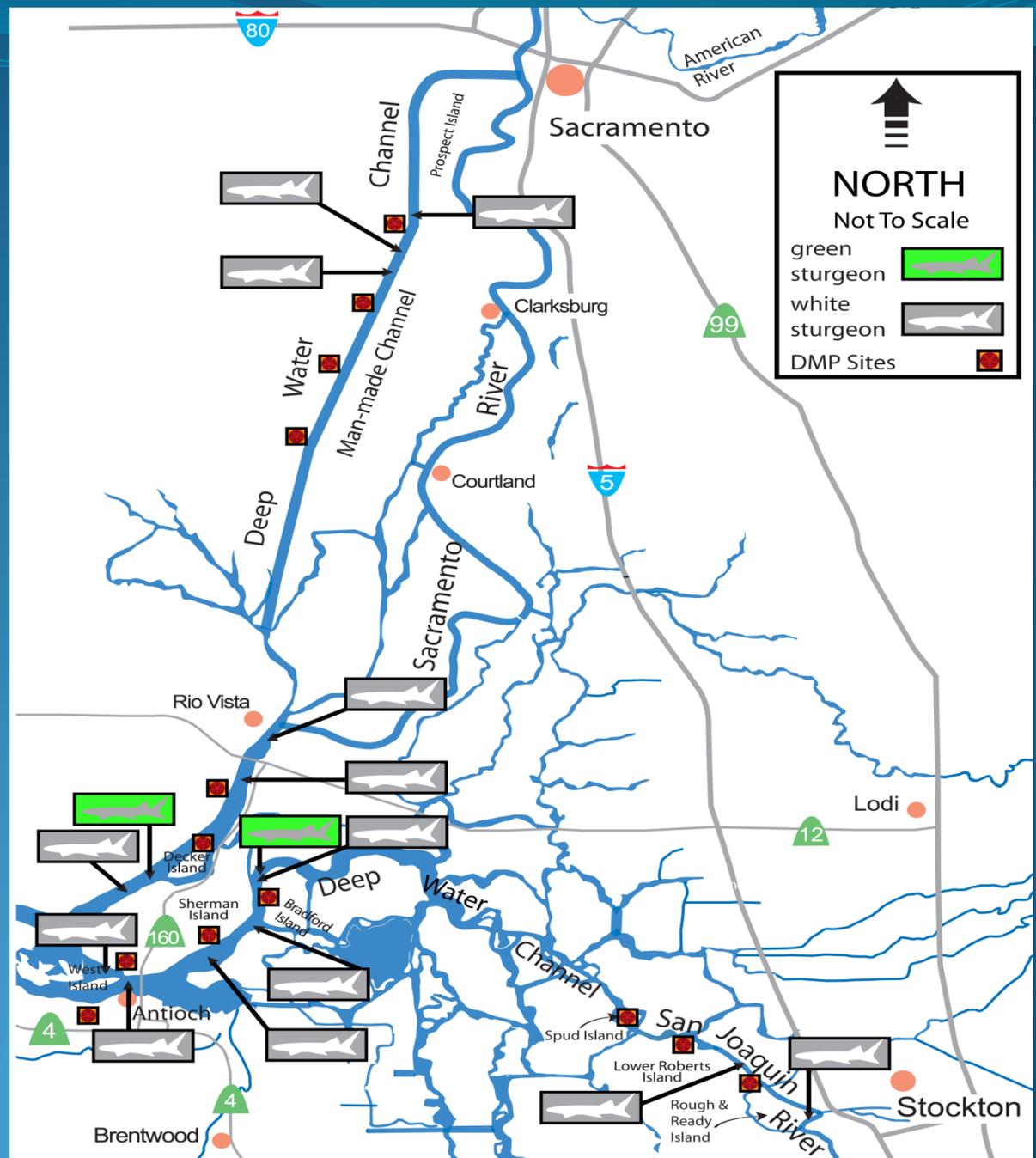


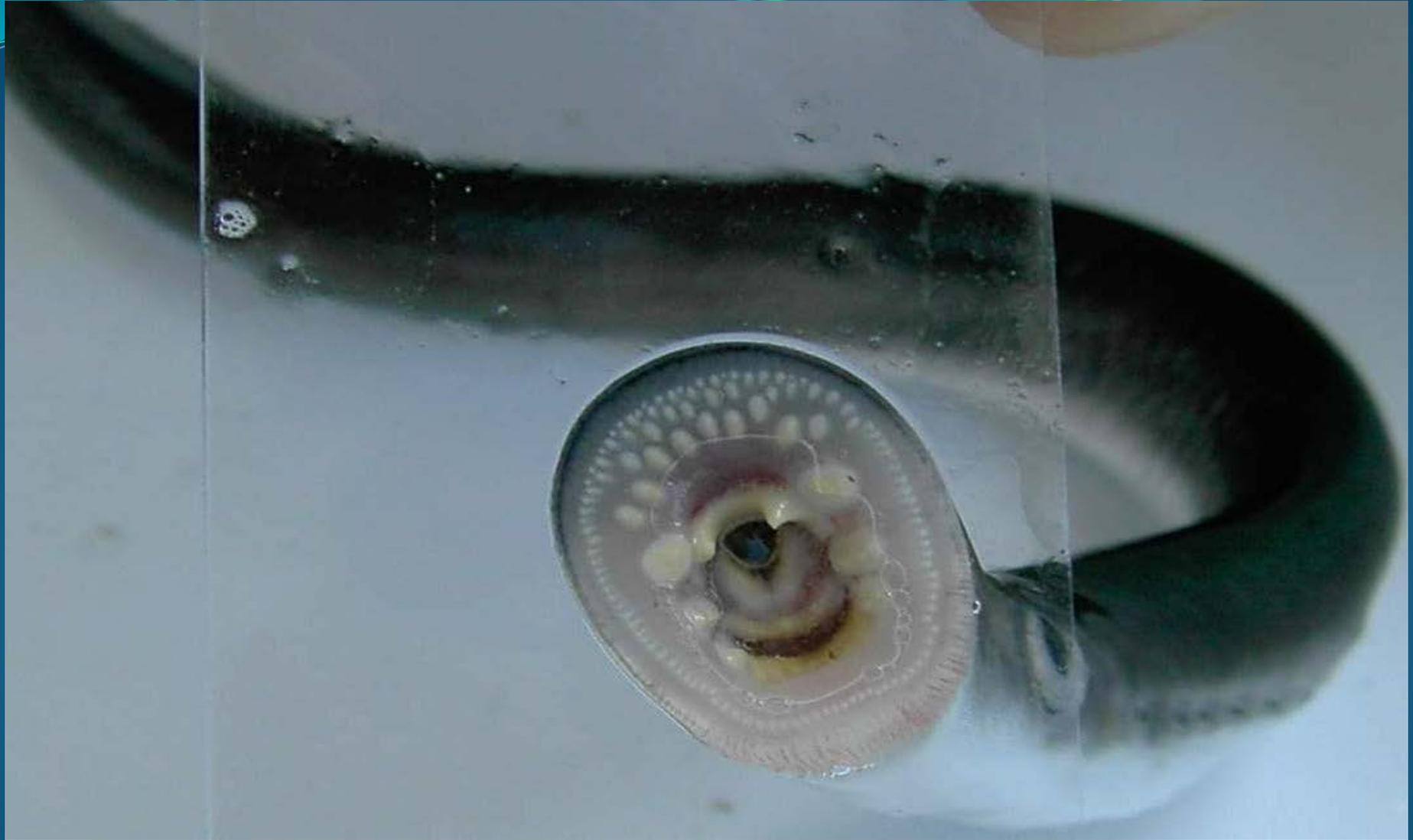
white sturgeon (juvenile)



green sturgeon *Acipenser medirostris* (juvenile)

SRDWSC and SDWSC locations where white and green sturgeon were encountered during monitoring from 2006 – 2013. (2014 & 2015 monitoring: no sturgeon were encountered).





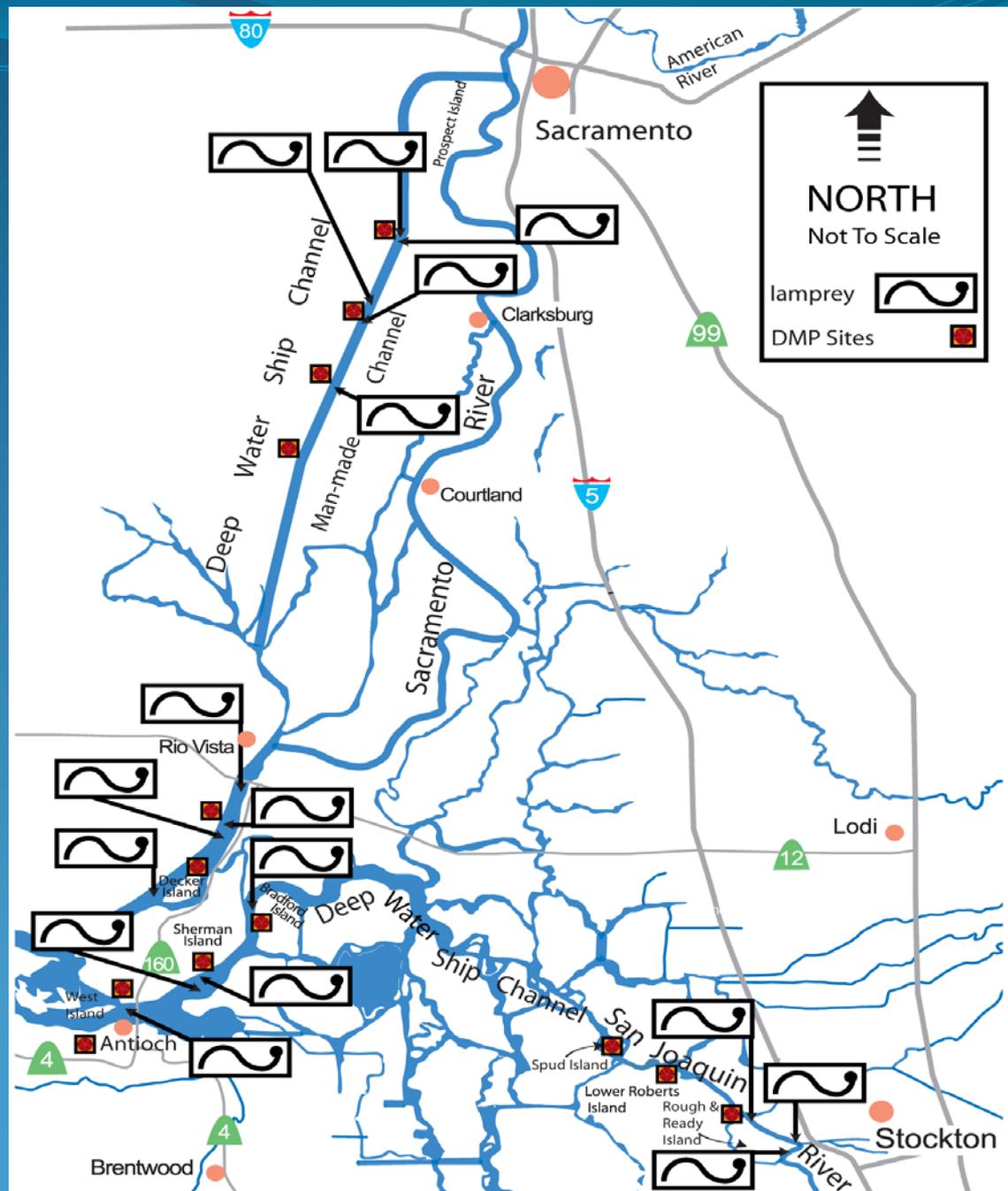
river lamprey *Lampetra entosphenus* (adult)

Photograph by David Rogowski



river lamprey (macrophthalmia stage)

SRDWSC and SDWSC locations where lampreys were encountered during monitoring from 2006 – 2015.



Total fish encountered during fish community and entrainment monitoring (TR and ES) in the SRDWSC and SDWSC 2006 – 2015.

•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	n ES	n TR	Common Name	Origin	Demersal/Pelagic
1	38.73	7	1.30	1237	592	shimofuri goby	Introduced	Demersal
2	14.93	--	--	477	--	river lamprey	Native	Demersal
3	10.61	3	12.45	339	5681	striped bass	Introduced	Pelagic
4	8.83	5	5.15	282	2351	channel catfish	Introduced	Demersal
5	8.05	1	47.64	257	21733	white catfish	Introduced	Demersal
6	7.42	23	0.03	237	13	lamprey, species undet. *	Native	Demersal
7	3.63	13	0.26	116	118	Shokihaze goby	Introduced	Demersal
8	2.19	2	20.44	70	9325	threadfin shad	Introduced	Pelagic
9	1.85	9	0.47	59	214	yellowfin goby	Introduced	Demersal
10	1.06	19	0.09	34	43	prickly sculpin	Native	Demersal
11	0.85	8	0.82	27	374	wakasagi	Introduced	Pelagic
12	0.50	4	7.30	16	3328	American shad	Introduced	Pelagic
13	0.47	17	0.12	15	57	brown bullhead	Introduced	Demersal
14	0.25	18	0.10	8	45	delta smelt	Native	Pelagic
15	0.13	16	0.16	4	73	bluegill	Introduced	Pelagic
15	0.13	25	0.02	4	9	Pacific staghorn sculpin	Native	Demersal
17	0.06	15	0.19	2	87	tule perch	Native	Pelagic
17	0.06	20	0.09	2	43	common carp	Introduced	Demersal
17	0.06	21	0.06	2	28	warmouth	Introduced	Pelagic
17	0.06	24	0.02	2	10	bigscale logperch	Introduced	Demersal
21	0.03	6	2.01	1	919	longfin smelt	Native	Pelagic
21	0.03	10	0.38	1	175	Sacramento splittail	Native	Pelagic
21	0.03	11	0.28	1	128	white sturgeon	Native	Demersal
21	0.03	33	0.002	1	1	Mississippi silverside	Introduced	Pelagic
--	--	12	0.26	--	119	redeer sunfish	Introduced	Pelagic
--	--	14	0.23	--	107	starry flounder	Native	Demersal
--	--	22	0.04	--	17	blue catfish	Introduced	Demersal
--	--	26	0.02	--	7	black crappie	Introduced	Pelagic
--	--	27	0.01	--	5	unidentified goby	Introduced	Demersal
--	--	28	0.01	--	4	green sturgeon	Native	Demersal
--	--	28	0.01	--	4	Sacramento blackfish	Native	Pelagic
--	--	30	0.01	--	3	Sacramento pikeminnow	Native	Pelagic
--	--	30	0.01	--	3	white crappie	Introduced	Pelagic
--	--	32	0.002	--	1	Chinook salmon **	Native	Pelagic
--	--	32	0.002	--	1	golden shiner	Introduced	Pelagic
--	--	32	0.002	--	1	largemouth bass	Introduced	Pelagic
--	--	32	0.002	--	1	rainwater killifish	Introduced	Pelagic
Total				3,194	45,620			

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