

Impacts from Low Flows

SHR-2-251

WaterFix and/or BDCP proposes to divert even MORE water from the Delta from the Sacramento River, compared to what has been reported in the past. However, starting about 2004 there have been ongoing changes in the Delta labeled as “restoration”, “fish screens”, levee repair, “habitat restoration” and “flood control” all of which combine to divert more fresh water into the South Delta Export pumps, and combine to leave insufficient fresh water flows in the Delta.



1920's-30's the Delta Queen and King traveled on Steamboat Slough



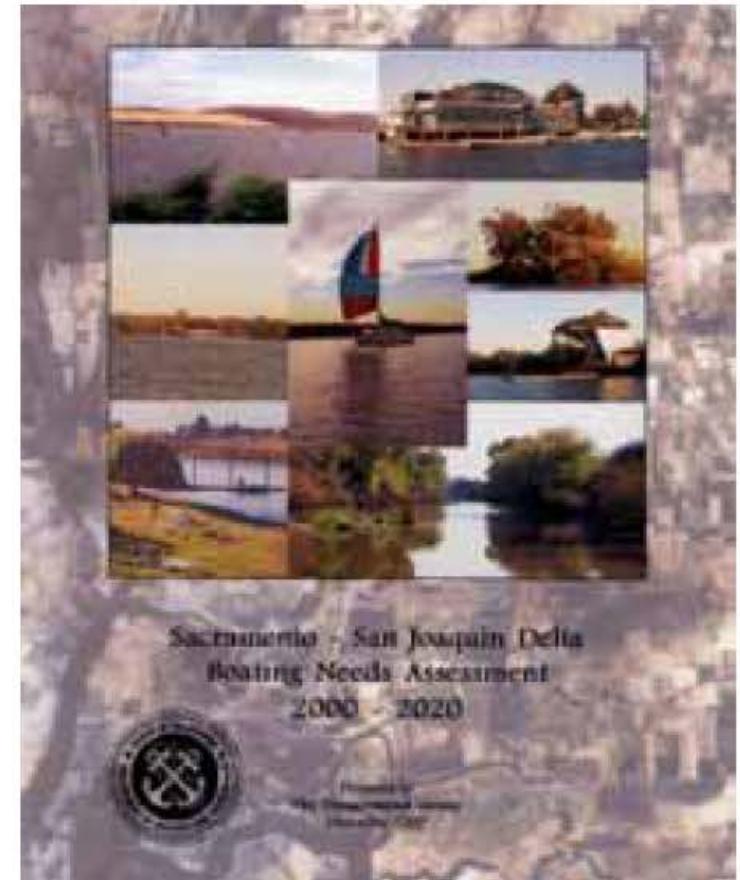
2017 fishing on Steamboat Slough at sunrise

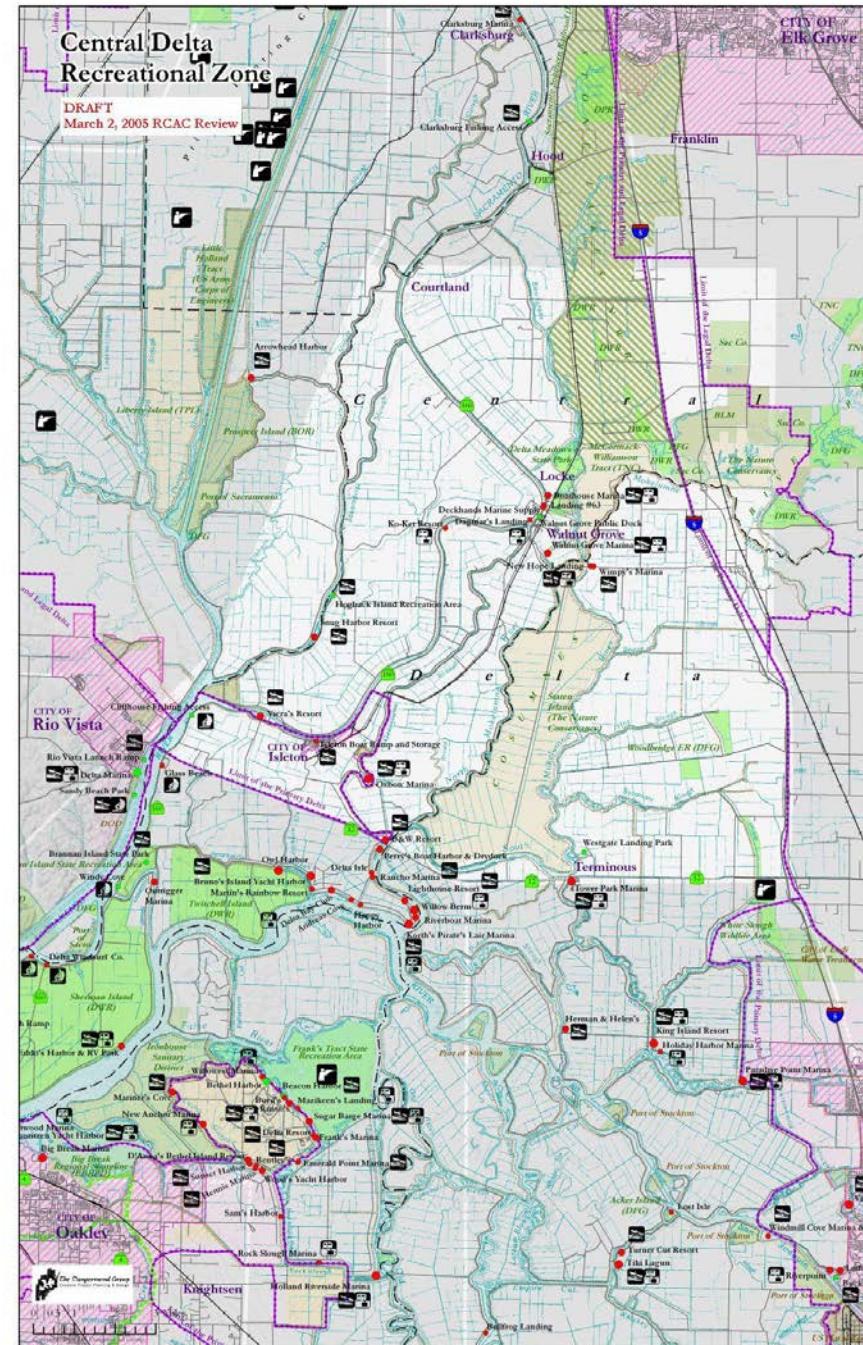
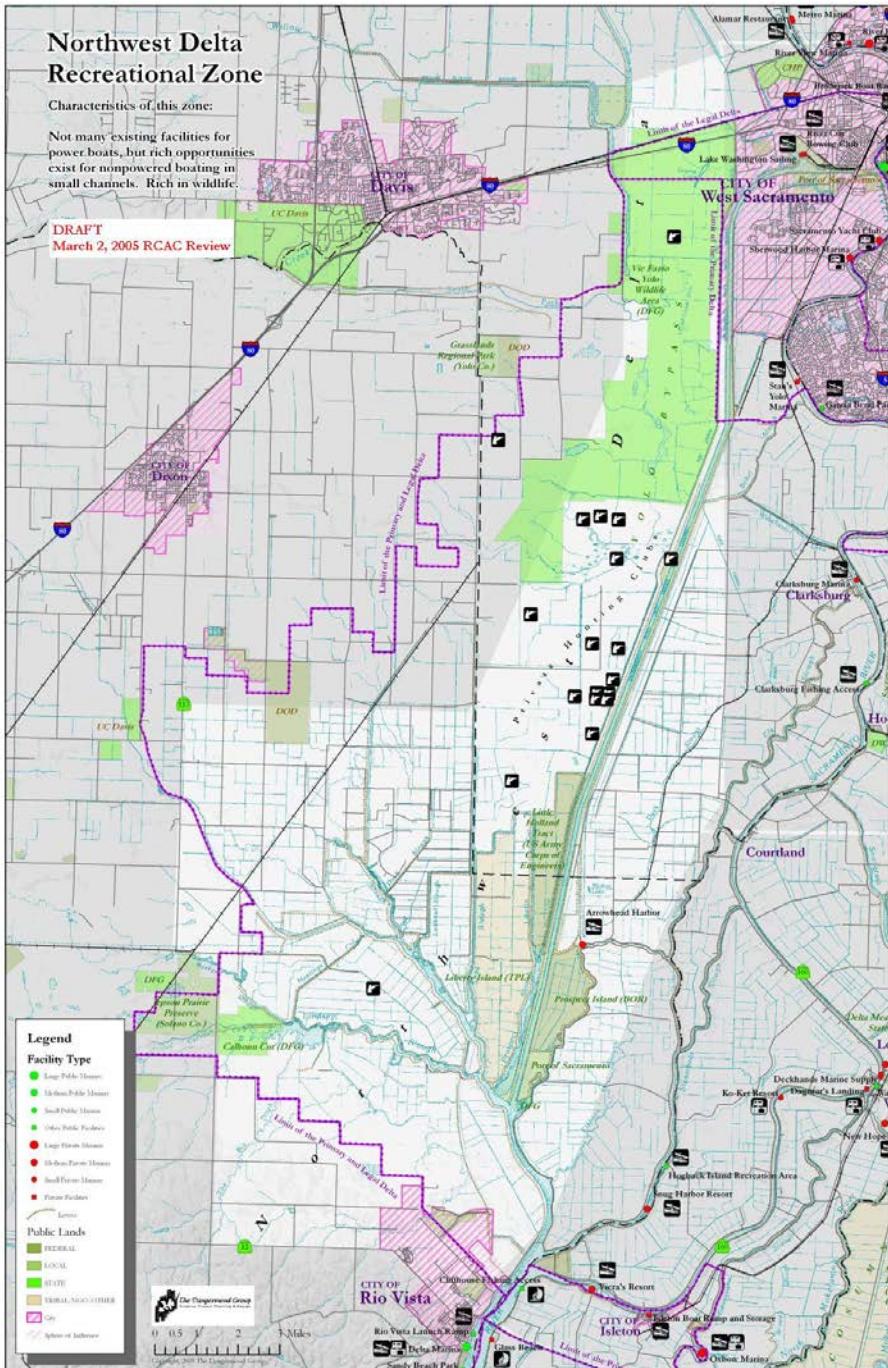
In addition to levee maintenance and enlargement, other levee-related efforts include levee subsidence studies, emergency response coordination (including the distribution of *flood fight boxes* containing emergency materials such as sandbags and hand tools), analysis of levee risks associated with seismic events, and dredged material management. The Levee System Integrity efforts have incorporated a number of ecosystem-related projects, such as the habitat development work currently underway at Decker Island, and certain provisions of the Program require that levee activities must result in net habitat improvement. Other agencies involved with the Delta Levee efforts include the U.S. Army Corps of Engineers and the California Department of Fish and Game, which serve along with DWR as Implementing Agencies of the Levee System Integrity Program.

http://www.waterplan.water.ca.gov/docs/cwpu2005/Vol_3/12-Delta/V3PRD12-Delta.pdf

Recreation

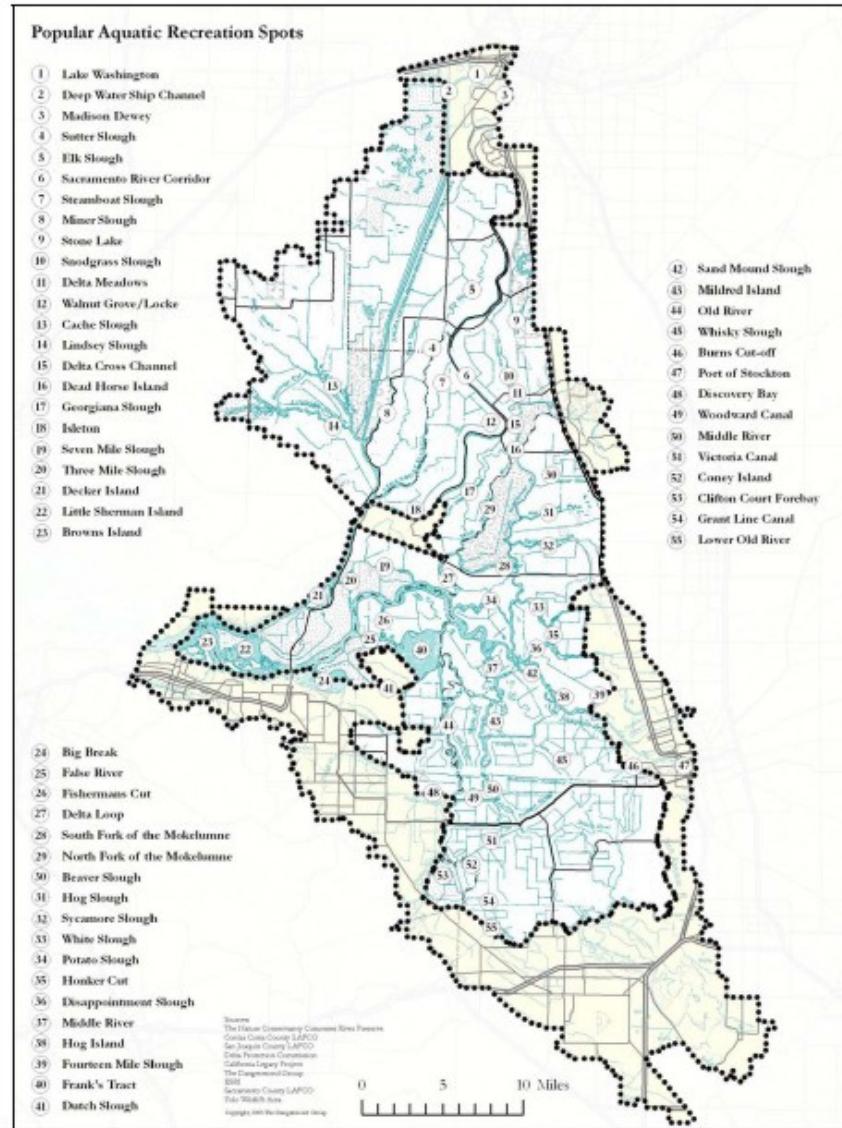
According to figures used in the 1995 Sacramento-San Joaquin Delta Atlas, the Delta was estimated to support 12 million recreational user days a year. According to surveys conducted in 1996 by the Delta Protection Commission (DPC)and the Department of Parks and Recreation (DPR), 23.5 percent of registered boat owners and 23 percent of licensed anglers in the State





Popular waterways per B&W report

Figure 2-2



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2007
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http://www.deltavision.ca.gov/Context_Memos/Recreation/Recreation_Memo_Interation1.pdf

Table 2: Estimated Delta Boating and Fishing User Days

ACTIVITY	ESTIMATED NO. OF GROUPS	AVG. NO. OF DAYS PER YEAR	TOTAL GROUP DAYS	AVG. NO. OF PERSONS PER TRIP	ESTIMATED TOTAL USER DAYS PER YEAR
Boating	186,000	26.1	4,854,600	2.97	14,418,162
Fishing	169,200	24.0	4,060,800	2.91	11,816,928

*User day estimates for boating and fishing cannot be added together because this would result in double counting. Double counting would occur because most boaters also fished and many anglers also boated.

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Popular Delta Recreation Activities. The 1996 DPR survey found that fishing from a boat was the number one recreational activity in the Delta among registered boat owners and licensed anglers. The majority of surveyed boat owners also reported using the Delta for pleasure cruising, swimming, and water skiing. Among licensed anglers, shore fishing and tournament fishing were also popular. Table 3 shows the most common boating and fishing activities reported by Delta boaters and anglers.^{xi} The table also shows the top ten recreation activities after boating and fishing that survey respondents reported enjoying in the Delta. Because the DPR survey only included boat owners and anglers, survey results most likely under-represent the popularity of non-boating and non-fishing activities in the Delta, such as wildlife viewing, picnicking, land-based hunting, and hiking. Nonetheless, the Delta is primarily known as a boating and fishing recreation destination, and these two recreation activities account for the majority of recreation activity occurring in the Delta.

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Since 2007 or 2008, it seems excessive fresh water is being either diverted before it reaches the Delta. Freshwater Inflows to the Delta have been so low that it appears we've had the worst infestation of invasive water weeds in the Recorded history of the Delta. Water weeds clog navigable waterways, get into boat engines, farmers water intakes And can cause flood hazard during high flows. The financial impact from closure or reduced use of a marina due to Inaccessible slips clogged with water weeds is obvious. The next few photos give examples of what happens to Delta Recreation locations when DWR/USBR manage the Delta in "DROUGHT" flows even when there is not a drought:



South Delta, very nice marina is completely clogged by water hyacinth, which grows very fast in stagnant warmer water. This marina has been operational since ? And never experienced this type of water weed infestation before 2013.

Only by 2016 did the state begin to slowly attempt to remove invasive water weeds in select areas of the Delta.

Since 2005, DWR/USBR has not consistently reported how much water is being exported from the Sacramento River watershed. Instead we've seen many new intakes built in and north of the Delta, new Delta bypass construction such as at the Folsom South Canal, and Yolo Bypass areas, and the result has been diminished flows into the North Delta, diminished flows into the Delta in general, diminished outflows from the Delta to the SF Bay, and an increase in salinity encroachment into the Delta during late summer months, at a minimum.

Even though required by law, the public is not provided with reliable and consistent export and outflow data since 2005. If DWR does provide the required "Delta Exports" data, when challenged, DWR simply changes the data with no explanation. In addition, what DWR reports to the public as exports, and what DWR uses for computer modeling for the WaterFix proposal are two very different sets of annual export numbers. (see screen shots at end of this slide set). DWR has not answered the question of which chart (or either) is correct export numbers. In any case, TO MUCH water is being exported from the Sacramento River watershed, leaving not enough fresh water flows in all areas of the Delta, as evidenced by the impacts to surface water quality, water temperatures, native fish species decline, and more.

The following series of photos and graphics show various areas of the Delta, and the businesses that have been significantly impacted as a direct result of insufficient freshwater flows into the Delta over the last 12 years. Rather than name the specific businesses, photos and general location on a Delta map are used for reference to give the general idea of impacts:

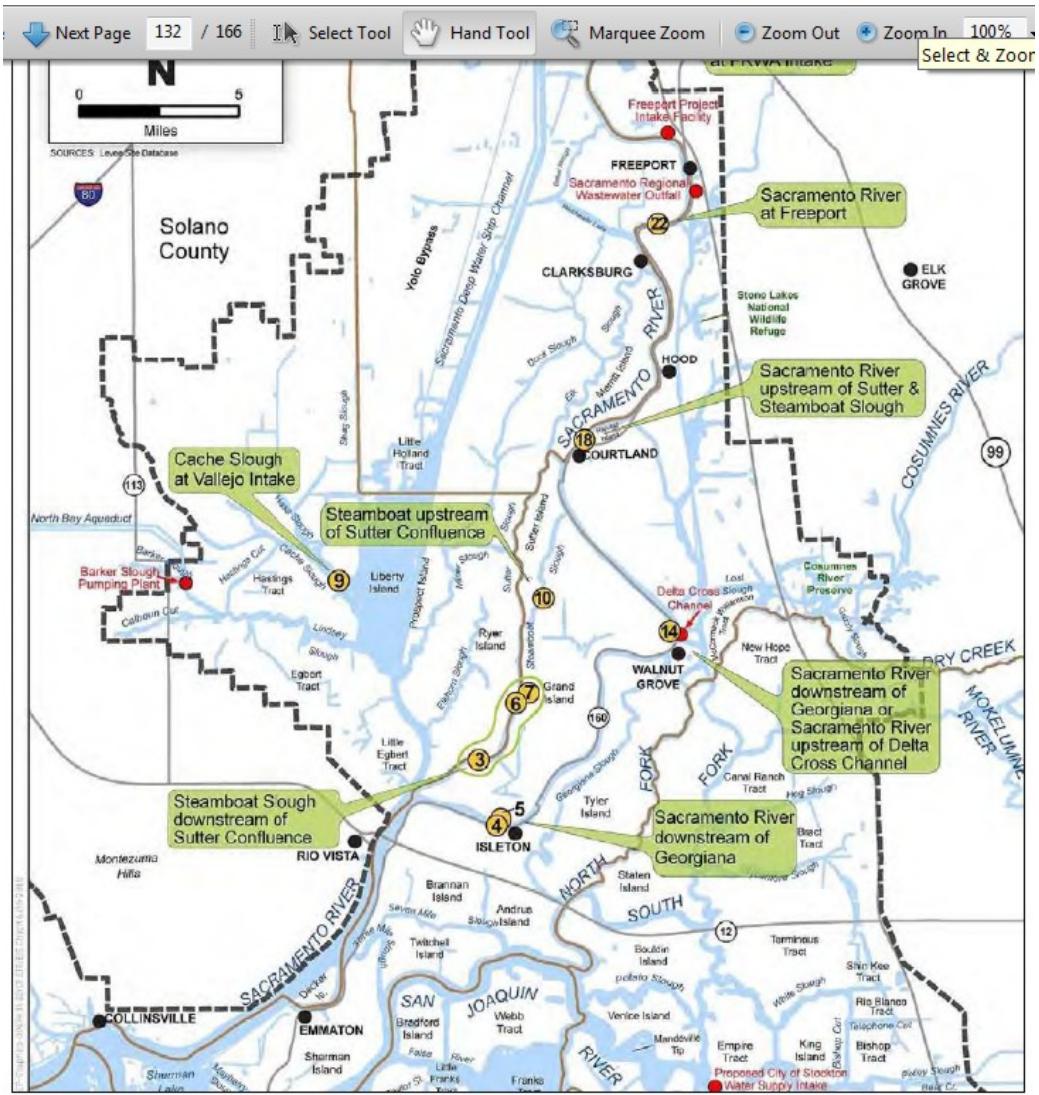


Figure 5C.4-27. Bench Habitat Analysis Sites

10-sediment insertion and bench test resulted in raising bed of waterway
 6,7 Large trees placed in waterway near banks to capture sediment & reduce waterway navigation and use in this area
 3 bench built up and planted with tules but was infested with *egeria densa* which is not suitable for salmonids. Also causes flood control issues as bench reduces water outflow in high flow times.

DELTA PLAN AMENDMENTS PROGRAM ENVIRONMENTAL IMPACT REPORT

- 1 • Ponds on the marsh plain that may hold water temporarily and permanently
- 2 • Ponds along the marsh-upland edge that capture local runoff and extreme high tides
- 3 • Mudflats along the banks of channels and at the water-side marsh edge except in low-energy freshwater environments where vegetation colonizes these areas
- 4 • Delta tidal marshes are predominantly freshwater, whereas Suisun Marsh tidal marshes are predominantly brackish. The confluence of the Delta and Suisun Marsh is subject to the greatest salinity variability; thus, the tidal marshes in these areas can fluctuate between brackish and freshwater conditions.
- 5 Historically, much of the Primary Planning Area was tidal marshlands, containing roughly 380,000 and 60,000 acres of tidal marsh, respectively. Today, the Delta supports approximately 7,000 acres, composed almost entirely of restored wetlands with some small patches of historic marsh (mostly small in-channel islands) remaining (see Figure 5.6-2). The largest patches of restored marsh are found at Sherman Island, Big Break, Liberty Island, and Little Holland Tract. Suisun Marsh has approximately 8,000 acres of tidal marsh, composed of a mix of ancient or historic marsh, centennial marsh (marsh formed on 19th-century Sierra Nevada hydraulic mining debris), and fringing marsh formed along banks of sloughs where tidal marsh has been diked and thus tidal flows reduced.
- 6 Tidal Open Water
- 7 The tidal open water community is defined as: (1) deep open water (greater than 10 feet deep from mean lower low tide [i.e., 19-year average of the lowest of the two low tides during the daily tidal cycle]); and (2) shallow open water (less than or equal to 10 feet deep from mean lower low tide) zones of estuarine bays, river channels, and sloughs. Under present operations, tidal open water in the Delta is mainly freshwater habitat, with brackish conditions occurring in the western Delta at times of high tides and low flows into the western Delta. In Suisun Marsh, surface waters are mainly brackish and occasionally fresh during times of high Delta outflow and saline during times of low Delta outflow.
- 8 Floating Aquatic Vegetation
- 9 Floating aquatic vegetation extends over the open water surface, either as free-floating plants or as colonies extending from plants rooted in banks. Some floating aquatic vegetation is native (e.g., most water primrose species and subspecies), but most floating aquatic vegetation in the Delta consists of highly invasive nonnative plants, such as water hyacinth, that occur in dense floating mats so thick they choke canals, channels, and irrigation ditches.
- 10 Floating aquatic vegetation also occurs in sloughs, especially near their source of origin where flows are slow. Abundant floating aquatic vegetation frequently presents a nuisance to boaters. Even native floating aquatic plants may become overabundant and invasive in nutrient-rich waters of urban and agricultural watersheds with diminished tidal and freshwater outflows. Floating aquatic vegetation borders marshes along large sloughs and small tidal channels in the Delta and may accumulate in such large

Lower Sacramento River Riparian Revegetation Project



Tule plantings as of June 2003 (left). Tule plantings after several years of establishment (2013, right).

Background

The Lower Sacramento River Riparian Revegetation Program is a joint feasibility study between the U.S. Army Corps of Engineers, Department of Water Resources, The Reclamation Board and the Metropolitan Water District of Southern California. Its purpose is to evaluate and develop methods for restoring and protecting riparian and shaded riverine habitat along the Sacramento River without affecting the flow capacity from Verona to Collinsville, including Steamboat and Sutter Sloughs.

The Sacramento River and many of the Delta Sloughs have been stripped of vegetation and lined with rock bank protection (riprap) to prevent erosion. The result has been a reduction of riparian and shaded riverine aquatic (SRA) habitat. The loss of SRA habitat is one possible contributor to the reduction of fish populations, including threatened and endangered species.

Project Description

The purpose of this demonstration was to verify that a properly designed levee site using appropriate plants, coordinated with locals and properly maintained can restore SRA habitat while maintaining adequate flood control and channel flow capacity.

Project Objectives

Enhancement Projects

- » (12) Decker Island
- » (13) Dutch Slough Tidal Habitat Restoration
- » (14) Grand Island Bank Revegetation
- » (15) Mayberry Farms
- » (16) McCormack Williamson Tract (Corps Levee Improvement Project)
- » (17) Sherman Island Saltlick Lagoon





2016 Stockton area



2014 Tower Park impact from low flows on the Mokelumne River



Summer 2015 Hogback County Park boat launch not useable



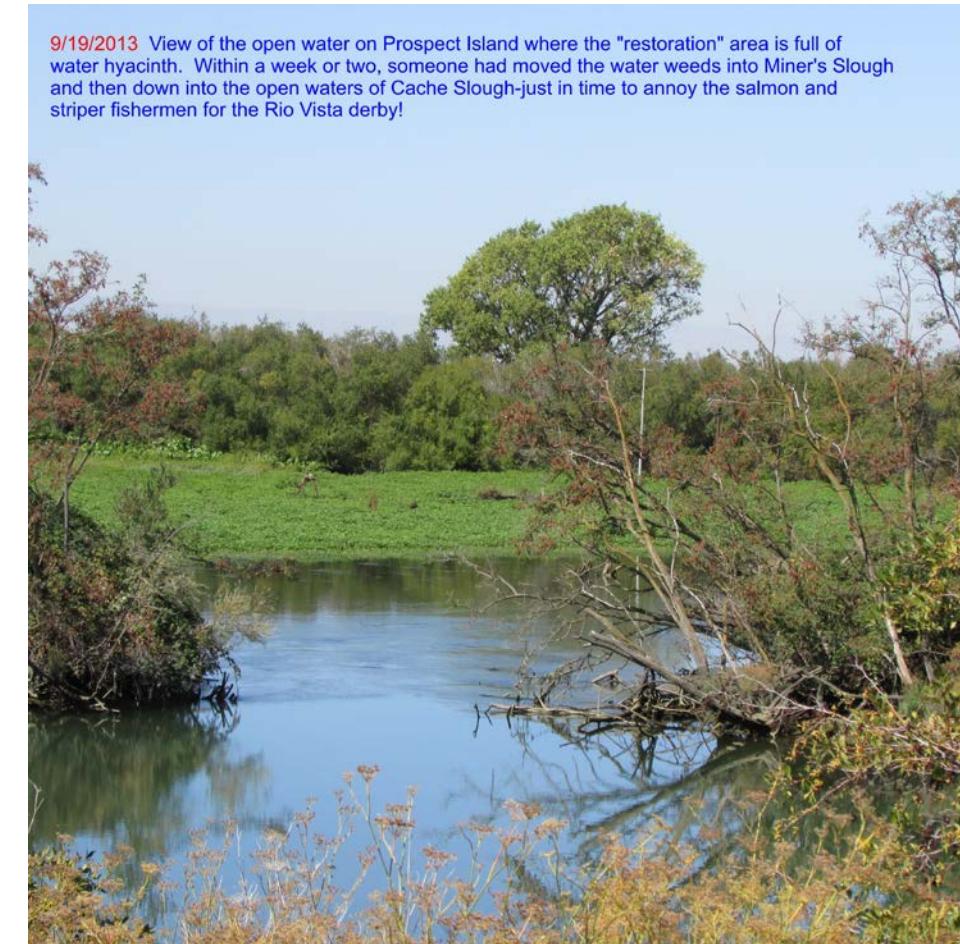
Prospect Island water hyacinth farm, for distribution of the plant to areas of the North Delta



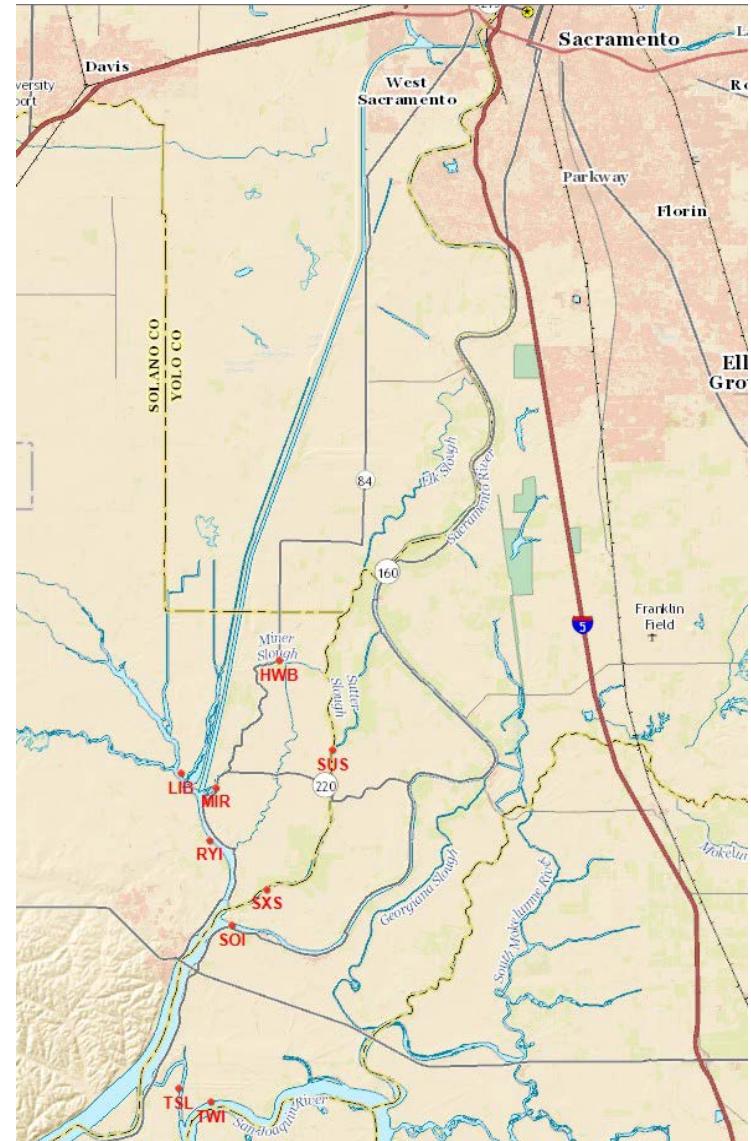
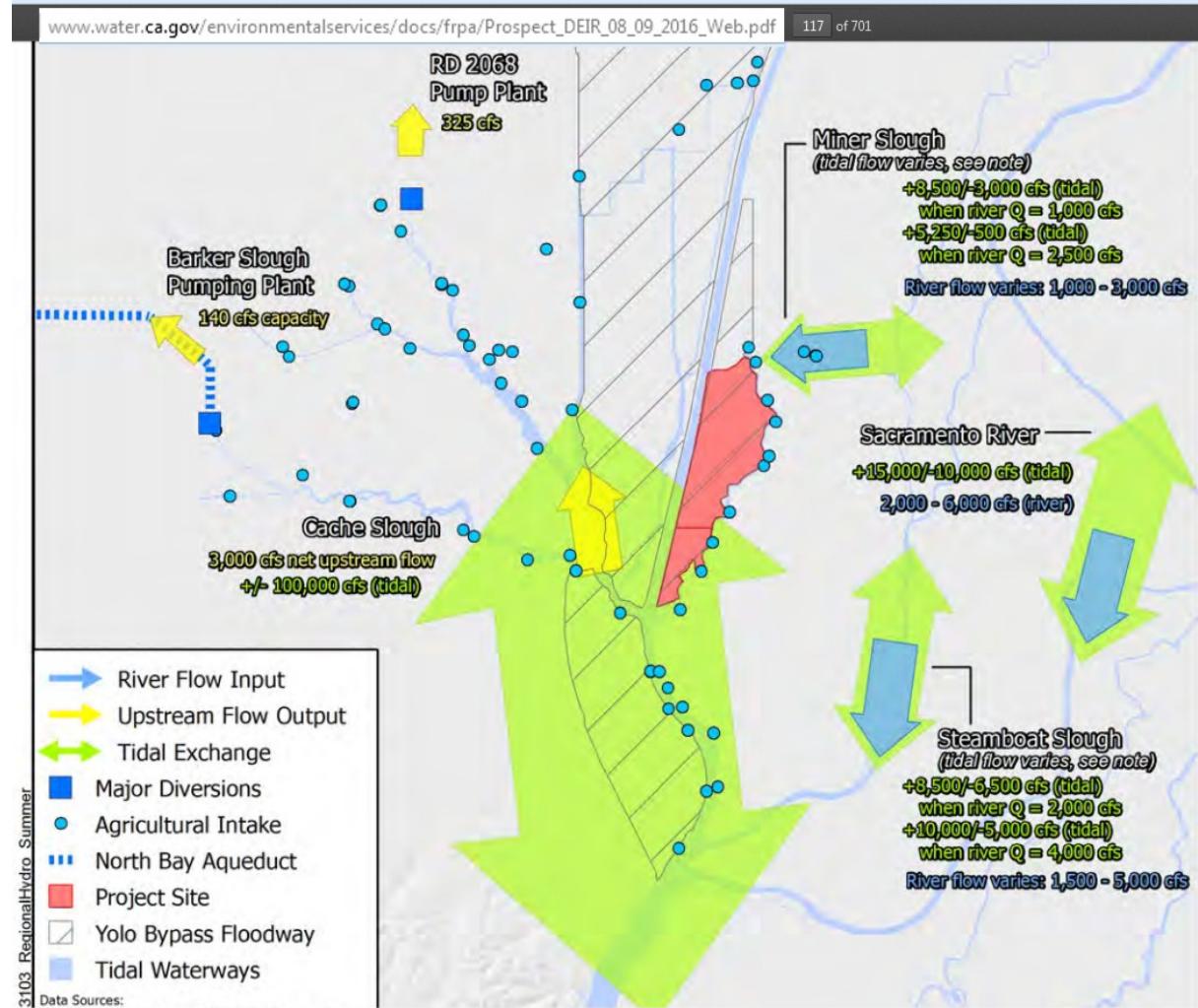


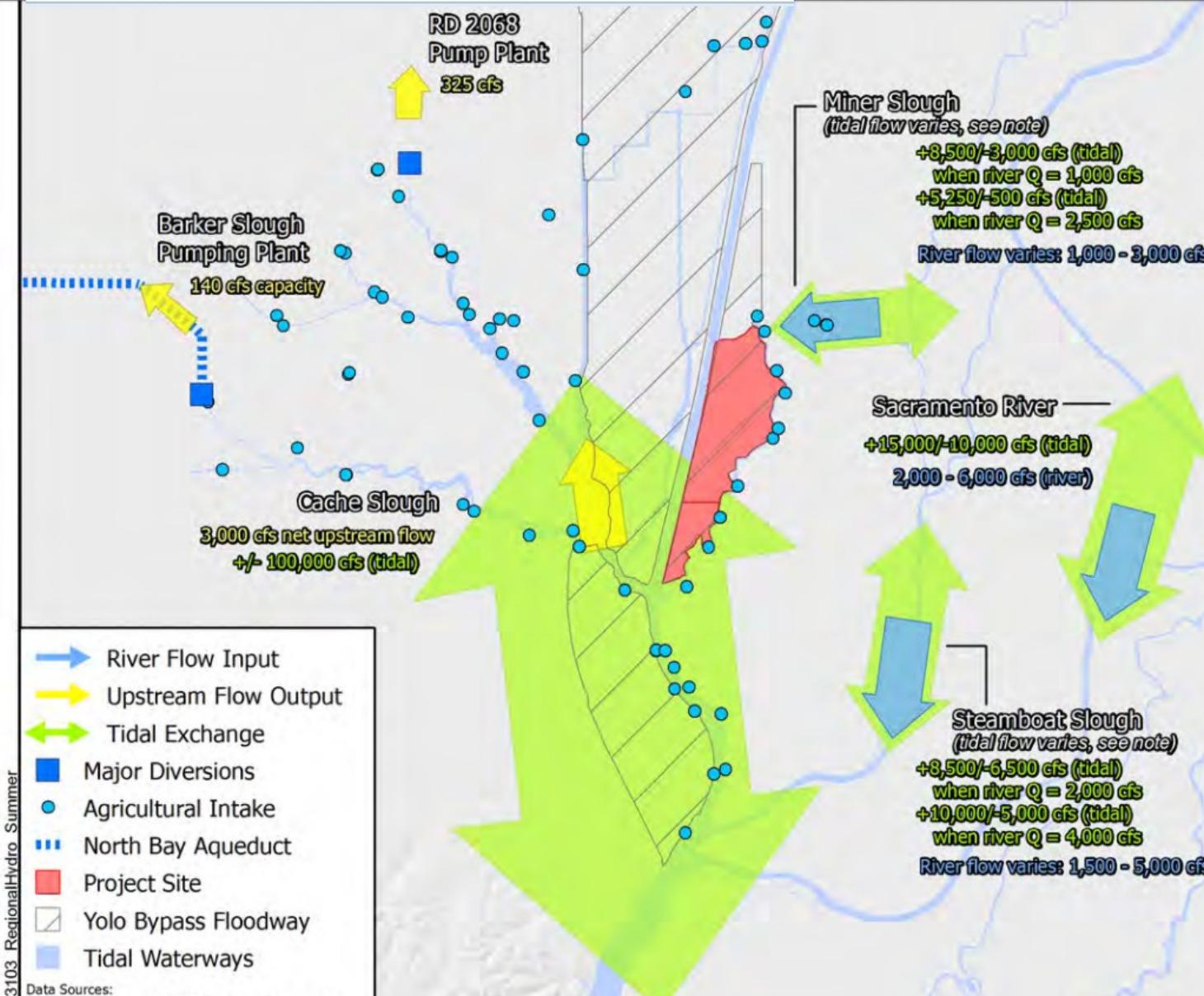
Waterweeds from the Prospect Island nursery shoved into Cache Slough just in time for the Rio Vista Fishing Derby 3 years in a row

North Delta, Prospect Island water hyacinth nursery: Each year since 2011 water hyacinth has been grown in the restoration experiments areas of Prospect Island, and then shoved out into Miner's Slough and Cache Slough right about the time of the fall Rio Vista annual Fishing Derby. The water hyacinth then floats upriver with the tides, spreading the invasive species into Steamboat Slough and downriver into the Sacramento River. Only in 2016 did the state begin steps to remove the invasive water weeds.



Pulse flows, gages and impacts







July 2017 low tide on the Sacramento River in Walnut Grove. Even though it was a record rain winter, DWR is still diverting so much flow away from the Delta that the river is at drought levels each low tide for part of the month



First-Time Participants

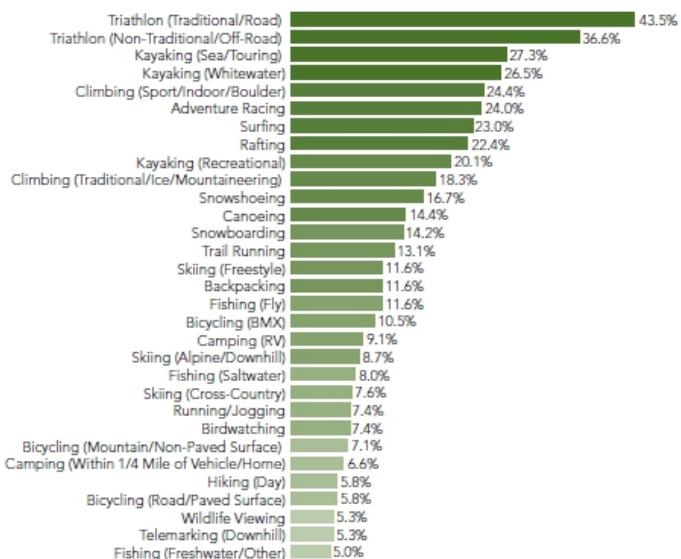
The percentage of new participants taking part in an outdoor activity each year can be a strong indicator of growth. In 2009, the percentage of new participants in the outdoor activities tracked by The Outdoor Foundation varied from 5 percent to 44 percent.

Activities with high percentages of first-time participants in 2009 included triathlon, kayaking, climbing and adventure racing. Activities with low percentages included freshwater fishing, telemarking, hiking and wildlife viewing.

Though an indicator of growth, the percentage of new participants in an outdoor activity is dependent on an activity's size and can also indicate activities with a high turnover in participants — activities that draw large number of new participants but also lose existing participants at the same time.

Percentage of First-Time Participants in 2009

All Americans, Ages 6 and Older



What Gets First-Time Participants Outdoors?

Family and friends are enormously important in encouraging participation in new outdoor activities, especially for young people. 54 percent of 6 to 24 year olds say that their friends' and/or family's participation in outdoor activities was the main reason they decided to participate in an outdoor activity for the first time in 2009. 37 percent said they wanted to try something new, and 25 percent pointed to the health benefits associated with outdoor activities.

While the encouragement of family and friends is clearly still important to older Americans, 39 percent of adults 25 and older pointed both to the health benefits and a desire to "try something new" as important motivators. Many also said that outdoor activities help them "relax and manage stress."

A significant number of Americans in both groups agreed that exercising outdoors is more fun or motivating than exercising indoors and that outdoor activities strengthen family ties.

On the flip side, classes, community programs, pressure by others, and articles or videos about outdoor activities didn't appear to get many up and active.

Why did you decide to participate in an outdoor activity for the first time this year?

	Ages 6-24	Ages 25+
My friends and/or family participate in outdoor activities.	53.9%	34.9%
I wanted to try something new.	36.7%	39.0%
Outdoor activities help me stay fit and healthy.	25.2%	38.8%
Outdoor activities bring my family together and strengthen family ties.	23.2%	23.1%
Exercising outdoors is more fun/motivating than exercise indoors	22.4%	30.3%
Outdoor activities are affordable.	17.2%	26.7%
Outdoor activities are close to my home.	14.8%	21.0%
I was introduced to outdoor activities at school.	13.8%	3.2%
Outdoor activities help me relax and manage stress.	11.4%	30.5%
Outdoor activities give me a chance to get back to nature.	11.3%	24.6%
I took a class or community program.	8.2%	2.1%
My kids are the right age now.	7.9%	17.2%
I was pressured by others.	4.7%	7.3%
I saw an article, show or video.	2.0%	2.8%

