



Interagency Ecological Program

Newsletter - Autumn 97

CONTENTS

- [Interagency Program Quarterly Highlights](#)
- [Coordinator's Strategy Meeting](#)
- [Delta smelt Concerns Result in changes in SWP/CVP Operations](#)
- [El Ninos and the Decline of Striped Bass](#)
- [Noteworthy for Managers](#)
- [Flow Effects and Density Dependence in Striped Bass](#)
- [Optimum Sampling Strategy for Sediment-Associated Pesticides in Suisun Bay](#)
- [Delta Outflow](#)
- [First Annual IEP Monitoring Survey of the Chinese Mitten Crab in the Delta and Suisun Marsh](#)
- [Late-Summer 1997 Dissolved Oxygen Conditions in the Stockton Ship Channel](#)
- [Adaptive Management of Emigrating San Joaquin Salmon Smolts](#)
- [Enhancing the Role of the Management Team](#)
- [Recalibration of DSM1 \(Suisun Marsh Version\)](#)
- [Future Direction of DWR/USBR Suisun Marsh Activities](#)

Readers are encouraged to submit brief articles or ideas for articles. Correspondence, including requests for changes in the mailing list, should be addressed to Randy Brown, California Department of Water Resources, 3251 S Street, Sacramento, CA 95816-7017.

Pat Coulston, Department of Fish and Game, Program Manager
Randall Brown, Department of Water Resources, Managing Editor
Larry Smith, U.S. Geological Survey, Interagency Coordinator Review
Vera Tharp, Department of Water Resources, Editor

The Interagency Ecological Program is a
Cooperative Effort of the:

California Department of Water Resources
California Department of Fish and Game
State Water Resources Control Board
U.S. Fish and Wildlife Service
U.S. Bureau of Reclamation
U.S. Geological Survey
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
National Marine Fisheries

BEFORE CITING INFORMATION CONTAINED HEREIN, BEAR IN MIND THAT
ARTICLES HAVE NOT RECEIVED FORMAL PEER REVIEW.

Delta Smelt Concerns Result in Changes in SWP/CVP Operations

Zachary Hymanson and Dale Sweetnam

State and federal export facility operations were modified in late May and early June in response to concerns over the distribution and high take of delta smelt. Since we have no direct measure of delta smelt losses at these facilities, we use salvage of delta smelt as surrogate for "take". Despite 1997 being an above-normal water year, this spring was the driest on record for central California (Figure 1). Consequently, the distribution of young-of-the-year delta smelt was more typical of dry year hydrology, with a greater proportion of the population remaining in the delta through spring and summer. This year was also unique due to a greater proportion of delta smelt spawning in the central delta than has been observed over the last several years. Delta smelt spawn in areas of fresh water under tidal influence. In dryer years, they generally spawn in the Cache Slough area; in wetter years spawning is widespread and can occur as far west as the Napa River. Therefore, this year's scenario of a large portion of the delta smelt population spawning directly in front of the export facilities and the lack of outflow to move delta smelt westward toward Suisun Bay elevated concerns to a high level.

The FWS biological opinion dealing with the effects of SWP/CVP opera-

tions on delta smelt uses various levels of combined SWP/CVP delta smelt salvage as triggers to initiate actions to reduce water project impacts on delta smelt. These thresholds include:

- The 14-day running average of combined delta smelt salvage, commonly referred to as the yellow-light level; and
- The cumulative total of combined salvage for each month, commonly referred to as the red-light level.

The red-light level is based on historical salvage data and varies among months and among water year types. For example, in an above-normal water year (like 1997) the red-light level ranges from 733 fish in December to 11,990 fish in October. Monthly red-light levels for below-normal water years are generally higher than for above-normal water years.

In 1997, the combined CVP/SWP delta smelt salvage increased dramatically during May as young-of-the-

year delta smelt grew large enough to be salvaged. Only delta smelt longer than 20 millimeters are considered to be "take" in the salvage operations. The yellow-light level was exceeded by May 12, and the red-light level (9,769 delta smelt) was exceeded by May 16 (Figure 2). Combined salvage remained high throughout the month, and by the end of May total monthly salvage (31,686 delta smelt) exceeded the red-light level more than threefold.

Several actions were proposed and implemented as a result of discussions within the CALFED Operations Group, the No-Name Group, and the Delta Smelt Work Group. These actions included:

- Holding project exports at 2,250 cfs and delaying export ramp-up until the end of May;
- Early removal of the temporary barrier at the head of Old River; and
- Opening the Delta Cross Channel gates.

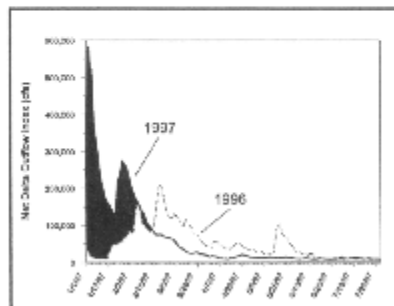


Figure 1
NET DELTA OUTFLOW INDEX,
JANUARY-JULY 1996 AND 1997

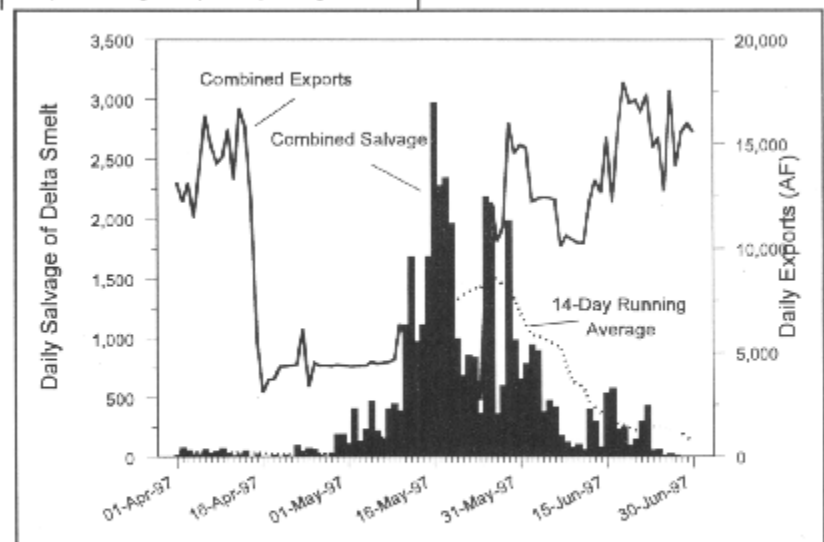


Figure 2
CVP/SWP DELTA SMELT SALVAGE, APRIL-JUNE 1997
Bars represent combined daily salvage of delta smelt.
Solid line represents combined daily exports, in acre-feet.
Dashed line represents the 14-day running average of delta smelt.⁷

As required by the opinion, USBR reinitiated formal consultation with FWS. As a result, FWS identified four actions for immediate implementation:

- Continue to hold the Delta Cross Channel gates open;
- Maintain combined CVP/SWP exports at 2,250 cfs until June 8, 1997;
- Maintain upstream water releases in the American and Sacramento rivers; and
- Maintain an export/inflow ratio of 35 percent.

All but the second item were implemented.

Although these limited actions were taken to reduce delta smelt take at the facilities in late May and early June; combined salvage remained high through early June. In response to con-

tinuing concerns, the flap-gates on the south delta temporary barriers were held open through much of June, and the SWP reduced exports by 1,000 cfs from June 7 through June 11. As part of this reduction in exports, the CALFED Management Team agreed (with concurrence from the SWRCB executive director) to allow an increase in the export/inflow ratio from 35 to 40 percent through the remainder of June as long as delta smelt salvage declined and the center of delta smelt distribution did not move eastward into the delta.

Daily review of delta smelt distribution from the 20-mm and real-time monitoring surveys and the number of delta smelt salvaged per acre-foot at the facilities were used to evaluate whether increased exports would move the center of delta smelt distri-

bution toward the export facilities (Figure 3). However, delta smelt salvage began declining in mid-June, and the center of distribution did not move back into the central delta. In fact, combined salvage moved below the yellow-light level by month's end.

The SWP and CVP were able to maintain an export/inflow ratio of 40 percent throughout the latter part of June, and the south delta temporary barriers became fully operational on June 24. Current accounting estimates of CVP/SWP operations show the actions taken for delta smelt this spring reduced combined exports by 24,000 acre-feet (14,000 in May and 10,000 in June) from base-case operations. However, an additional 48,000 acre-feet was recovered by relaxation of the export/inflow ratio from 35 to 40 percent in June.

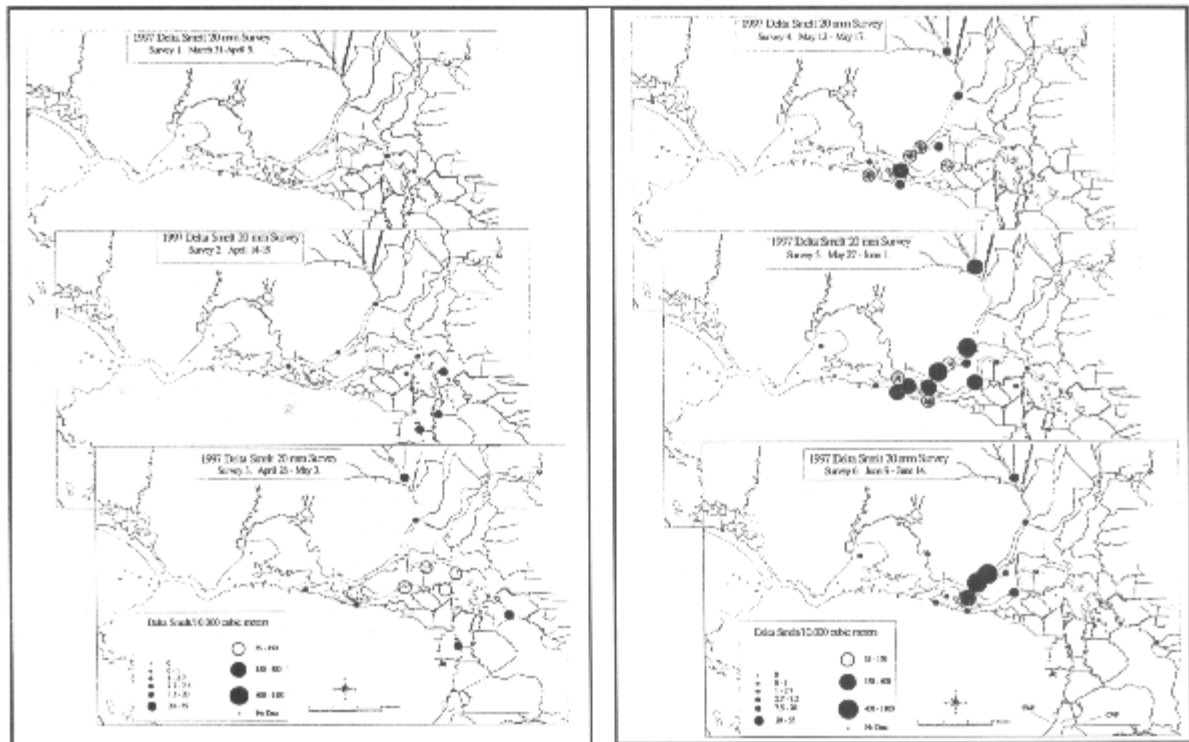


Figure 3
DELTA SMELT DISTRIBUTION AND ABUNDANCE IN THE FIRST SIX 20-MM SURVEYS IN 1997
Circles represent the average density (delta smelt/10,000 m³) at each station sampled three times every 2 weeks.