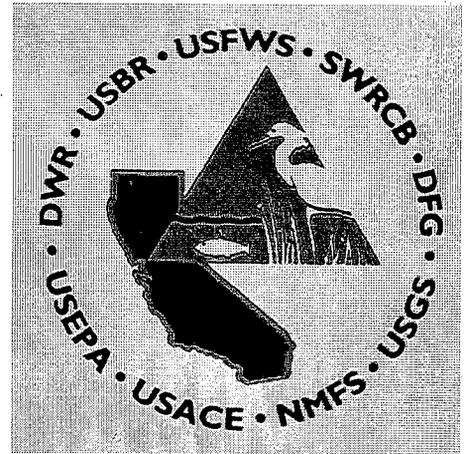


Newsletter

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For information on the Interagency Ecological Program, visit our home page on the World Wide Web (www.iep.water.ca.gov).

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.



Interagency Program Quarterly Highlights

These Quarterly Highlights summarize significant activities and findings of the Interagency Program during the past 3 months.

Delta Flow Measurement

Rick Oltmann

All of the UVM sites provided usable data throughout the quarter except for the San Joaquin River at Jersey Point and Threemile Slough sites, both of which had transducer piles destroyed by passing vessels. The Jersey Point site went down on June 16 and was back up on July 23; the new pile was installed about 300 feet to the

east of the previous location. The Threemile Slough site went down September 20 and should be back up by mid-October.

The six ADCPs deployed in the southern delta on April 1-2 were retrieved June 23. The ADCPs had been deployed at: San Joaquin River between Turner and Columbia Cuts; Turner Cut; Middle River between Columbia Cut and Connection Slough; Victoria Canal; Old River between Clifton Court Forebay intake channel and Grant Line Canal; and Grant Line Canal east of Tracy Road Bridge and the Grant Line temporary barrier.

During the deployment period, 276 flow measurements were made at the sites for use in developing velocity ratings. The computation of 3-month flow time series for five of the six sites is in progress; the Grant Line Canal ADCP was knocked over on April 17, so there will only be a 17-day flow time series for that site.

The movement of the 48 liters of rhodamine-WT dye released in conjunction with release of 50,000 salmon smolts on April 28 on the San Joaquin River at Mossdale was tracked fairly well by the automatic samplers installed throughout the

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delta. The dye took about 10 hours (velocity about 2 fps) to reach the first UVM site, San Joaquin River at Stockton. San Joaquin River flow upstream of the Port of Stockton during the release period was about 5,700 cfs and unidirectional because of the pulse flow that was occurring to help guide salmon smolts to the north. It took 37 hours (net velocity about 0.4 fps) for the dye to reach the next sampling site, Turner Cut. Flows from the Port of Stockton to Turner Cut were not unidirectional. Due to tidal dispersion, the dye concentrations significantly decreased with time and distance until no discernible dye concentration peaks could be seen at sites such as San Joaquin River at Jersey point and the Old River UVM. Results of this study will be documented in a future *News-letter* article.

Neomysis / Zooplankton Study

Jim Orsi

New species continue to appear in the plankton. A pilot expansion of IEP zooplankton surveys into the lower embayments caught an unidentified mysid species in September. It has been sent to the University of Alabama for identification. This species was found in all three lower bays and was the most abundant mysid taken; it peaked at 36/m³ in South Bay. Abundance of the native *Neomysis* continues to remain low, with none caught in August and September and only 25 in July. In August, however, the exotic *Acanthomysis* reached a quarterly high of 301/m³ in Suisun Bay.

The copepod picture has been stable for several years. As usual, *Eurytemora* was not caught this quarter and for the first time *Acartia* was also absent, although its abundance has been extremely low in recent years. *Pseudodiaptomus forbesi*, the dominant calanoid copepod, was not very

abundant, except in August in the San Joaquin River at Stockton, where it reached 12,000/m³. *Limnoithona* was again the numerically dominant copepod; it had peaks of 40,000 to 57,000/m³. This is a small cyclopoid copepod that is eaten by delta smelt. Cladocerans and rotifers were not abundant during July and August but became fairly abundant in September in the San Joaquin River at Stockton.

Herbicide Concentrations and Effects on Phytoplankton

J. Edmunds, K. Kuivila, and J. Cloern

This is a new special study under the Contaminant Effect Team. Field work began May 26. Sampling has two parts — spatial and temporal. Spatial sampling includes nine delta sites, which are being sampled five times: May 27-29, June 10-12, June 24-26, October 14-16, November 11-13. The sites are: San Joaquin River at Vernalis; French Camp Slough at McKinley Way; Paradise Cut Bridge; Middle River at Bacon Island; Old River at Bacon Island; Werner Slough; Sutter Slough Bridge; Beaver Slough at Blossom Road; and Mokelumne River at New Hope Bridge.

Temporal sampling is done every other week at the Middle River at Bacon Island Bridge, May 28 through November 12. A water sample is collected at each site and analyzed for herbicide concentrations, phytoplankton biomass (chlorophyll *a*), species composition, phytoplankton photosynthesis, and basic water quality measurements. Herbicide concentrations are analyzed by both GCMS and HPLC. Phytoplankton photosynthesis is the maximum assimilation rate, measured as 14-C uptake. Basic water quality measurements include turbidity, temperature, specific conductance, alkalinity, dissolved nutrients, and dissolved organic carbon.

Juvenile Salmon

Mark Pierce

Midwater trawling at Sacramento over the summer caught more juvenile salmon than in most past years, with 42 fall-run- and 7 late-fall-run-sized chinook captured, most of them in July. In addition, although we typically catch some adult chinook during summer trawling at Chipps Island, the number caught in 1997 was unusually high, with more than 60 captured since May. Unlike last year, delta smelt take has been low and has not limited the sampling.

Juvenile winter-run-size chinook have been seen in high numbers in upriver sampling by DFG and FWS at Red Bluff, although they have not yet been detected in the lower river or delta this season. When they do arrive, probably with the first significant storm, we expect to see many more than in recent years.

Results of 1996 comparative releases at Dos Reis and Jersey Point of coded-wire-tagged juvenile salmon reared at Merced and Feather River hatcheries suggested Merced fish survival to Chipps Island was greater than that of Feather River fish. Similar comparative releases in 1997 initially indicated that Feather River fish survived at higher rates. However, in 1997 the Feather River stock fish were substantially larger than the Merced stock. When the survival data were corrected for this size difference, the survival rate for the Merced group was again higher in 1997 (1.5 to 1), albeit to a lesser extent than in 1996 (2.5 to 1).

The IEP is generally converting to a new software, called Access, for data entry and storage. We have begun entering the juvenile salmon monitoring data for the 1998 field year in this new format. Some bugs are being worked out with the transition from dBASE, but Access promises to allow more flexibility and ease of data analysis.

Resident Fishes

Larry Brown

Our primary activity in the last quarter was a review of proposals for the 1998 program. Six proposals for new work were considered:

- A comparative study of the environmental preferences and tolerances of wakasagi and delta smelt;
- A laboratory study to determine effects of trace metals and pesticides on delta smelt larvae;
- A comparison of the diet of delta smelt and inland silversides;
- Culture of delta smelt;
- A proposal to supplement the fish monitoring component of an ongoing Category III study; and
- A study of habitat use of delta smelt in the southern delta and Clifton Court Forebay.

After the projects were reviewed, a prioritized list of current delta smelt and splittail studies and new elements was submitted to the Management Team.

Dale Sweetnam has retired as chair of the Resident Fishes Team. Many thanks to Dale for his contributions. Larry Brown is the new Chair and can be contacted at: Larry R. Brown, U.S. Bureau of Reclamation, MP 151, Scientific Support, 2800 Cottage Way, Sacramento, CA 95825 (Phone 916/978-5043, FAX 916/978-5055, email lbrown@ibr2mp700.mp.usbr.gov).

Splittail

Randall Baxter

No field work was directed specifically at splittail this spring or summer. A proposal has been submitted to the Resident Fishes project work team and initial preparations have begun to use radio telemetry to track adult splittail to their spawning grounds this winter. Draft articles are

almost complete on the use of various hard structures for aging splittail and on splittail fecundity. These articles will be submitted for publication within the next few months. A progress report on the 1996 splittail radio tracking and larval trapping is being written as well, but it is too early to project a completion date.

Vernalis Adaptive Management Program

Zachary Hymanson

A technical workshop on the Vernalis Adaptive Management Program (VAMP) was held September 25. The workshop began with a brief discussion of goals, objectives, and the conceptual framework of VAMP, followed by a discussion of test conditions and study results for 1997. The workshop concluded with an identification of issues necessary to consider in planning for 1998.

VAMP takes advantage of several established monitoring programs to determine if survivorship of emigrating juvenile fall-run chinook salmon could significantly benefit from varying San Joaquin basin flows and SWP/CVP export rates. This was considered a pilot year, focusing on program coordination and data acquisition. However, the workshop revealed that substantial data was generated in this first year, and 1997 may, in fact, qualify as the first year of VAMP studies. Future meetings are scheduled to discuss plans for 1998.

Sport Fish

David Kohlhorst

On September 3, we started tagging legal-sized (117-183 cm) sturgeon captured in a trammel net in San Pablo Bay. We last tagged sturgeon in 1994, when 264 white sturgeon were tagged in 38 days of fishing (7.0 tagged per day). No green sturgeon

were tagged in 1994. So far this year, in 21 days of fishing, we have tagged 649 white sturgeon (30.9 tagged per day) and 8 green sturgeon. This suggests a substantial increase in sturgeon abundance since 1994 in San Pablo Bay and probably in the entire estuary. When tagging is completed at the end of October, we can estimate the population size based on a multiple-census mark/recapture technique and also update population estimates for previous years based recaptures of tagged fish from those years. The apparent increase in abundance may be due to a combination of recruitment of the strong 1982 and 1983 year classes since 1994 and return of fish to the estuary from the ocean after the end of the persistent drought of the late 1980s and early 1990s.

Catches of other species in the trammel net have generally been similar to 1994. A notable exception is the decrease in shark catches. We caught 460 leopard sharks and 18 seven-gill sharks in 1994, but have caught only 37 leopard sharks and no seven-gill sharks this year.

Fish Facilities

Kevan Urquhart

The Coordinators have approved the concept of creating a new component for fish facilities coordination. A meeting will be held in November to refine a draft "Proposal to Coordinate Central Valley Fish Facilities Activities through the Interagency Ecological Program"; gain consensus on which programs will be coordinated by this branch of the Interagency Program; and develop priorities for fish facilities, fish passage, and fish screening projects/research in 1998 and beyond. These priorities will help guide Interagency Program funding of fish facilities work in 1998.

The new Fish Facility Coordination component will share many of the structural, coordination, and oversight features of the existing Ecological Studies and Monitoring component, except that the Fish Facilities Coordination and Review Team will not directly manage programs, studies, and projects. Instead they will provide coordination, oversight, policy development, and inter-agency review. Existing interagency fish facility committees, programs, units, and projects will be similar to project work teams under the existing IEP structure but will maintain their autonomy. They will be encouraged to pass information to a member of a new "Fish Facilities Coordination and Review Team" representing their lead agency, so that all agencies can be better coordinated for increased effectiveness with the limited funds available for fish facilities work. The IEP Directors intend that the Fish Facilities Coordination and Review Team function as a clearinghouse for interagency review of new programs and proposals, so that the funding agency can be assured that proposals have received interagency review and, if possible, been revised to gain unanimous interagency support.

Summer Tow-Net Survey

Lee Miller

The 1997 summer tow-net abundance index for striped bass is 1.6, the lowest annual index measured in the bay/delta. The previous low index was 2.1, measured in 1996. This year's index also falls well below the average index of 66.6 for 1959-1976 and below the average index of 17.4 for 1977-1996. Thus, the general trend of low abundance indices since 1977 continues.

The final abundance indices were 0.6 for the Suisun area and 1.0 for the delta area, reflecting a higher concentration of striped bass in the delta, particularly in the lower San Joaquin River. Although 1997 was a wet year, this distribution is typical of a dry year, in which optimal nursery habitat is in the upstream portion of the estuary. The dry year distribution is probably due to the extremely dry February-June period.

The first tow-net survey began June 27, a day later than scheduled due to a cracked oil pan on the *Striper II*. Both surveys were conducted using the *Scrutiny*, a boat borrowed from DWR. Striped bass were large on the first survey, with a mean length of 33.4 mm, suggesting they spawned early or grew fast due to higher-than-average spring temperatures.

Fall Midwater Trawl Survey

Lee Miller

Four monthly surveys are scheduled for the 1997 Fall Midwater Trawl Survey. The September survey was completed on the 18th, with a total of 235 striped bass sampled. The abundance index was 286, the highest September index since 1993, when the index was 506, and was almost four times the record low of 71 set in 1996. Typically, the tow-net and fall midwater trawl abundance indices are correlated, but the summer tow-net index was a record low and the September midwater trawl index was only the 10th lowest of record. However, this year's index is still relatively low considering the highest index was 12,111 in 1967.

Coordinators' Strategy Meeting

Randall Brown

On July 30 and 31, the Interagency Coordinators, Pat Coulston, Leo Winternitz, and Steve Ford met to discuss ways to improve the program as well as future directions. We also reviewed responses to questions about program scope and direction. A key discussion item was the Program's potential role in CALFED. A few action items from the retreat were:

- Enhance the role of the Management Team (see article this issue) and increase effectiveness of the project work teams.
- Make better use of the Scientific and Management advisory groups.
- Enhance communications with those who use IEP data and information.
- Continue discussions with CALFED management of the Interagency Program's role in the bay/delta and the watershed.
- Make strategic (*ie*, long term) planning an integral program component.

The coordinators conceptually agreed that the Interagency Program should not be limited to the bay/delta or to its existing technical components. (A holistic, ecosystem approach may require expansion into the watershed and inclusion of additional technical disciplines.) We also agreed to consider new organizational structures.

The challenge will be to follow through with the action items developed at the meeting. Everyone, from the coordinators to project work team members, is far too busy. Almost without exception, folks working in the Interagency Program are pulled several directions by competing demands for their time. Long-term improvement will require more staff dedicated to the program and more time from existing staff and management.

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.

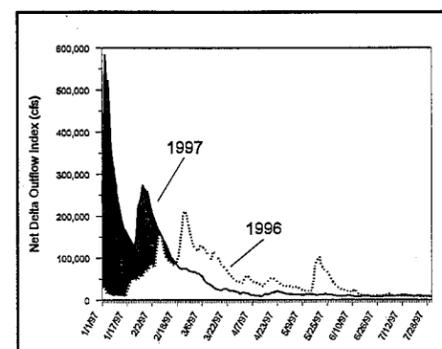


Figure 1
NET DELTA OUTFLOW INDEX,
JANUARY-JULY 1996 AND 1997

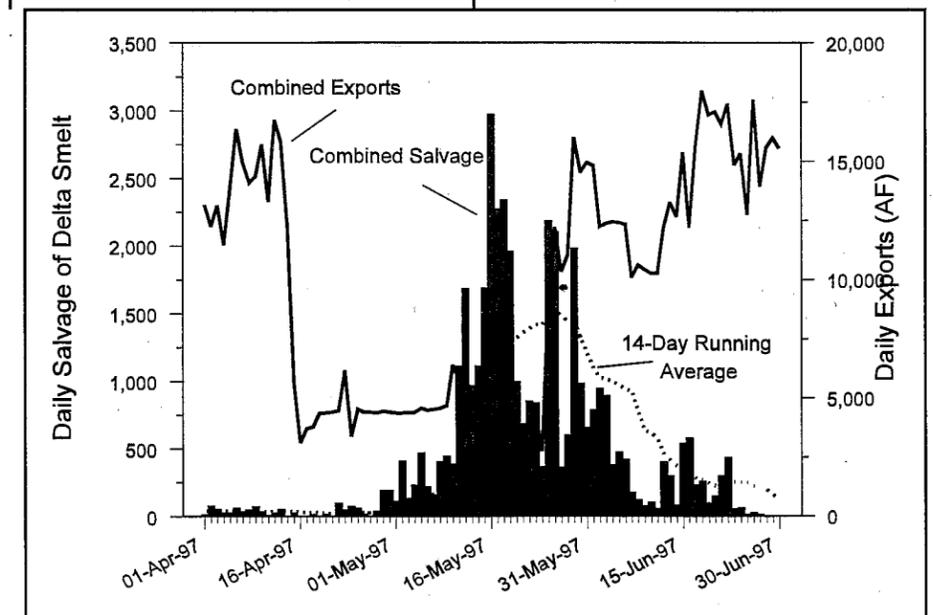


Figure 2
CVP/SWP DELTA SMELT SALVAGE, APRIL-JUNE 1997
Bars represent combined daily salvage of delta smelt.
Solid line represents combined daily exports, in acre-feet.
Dashed line represents the 14-day running average of delta smelt.⁷