

Interagency Program Highlights

In the past, routine informal reporting of significant activities and results of Interagency Program elements has been accomplished through stand-alone quarterly reports. Beginning with this issue, program highlights will be a regular part of the *Newsletter* to call attention to significant findings and activities of the monitoring and special study elements. This will supplement more formal reporting provided by the annual reports, technical reports, and publications by individual agencies.

Program Revisions

Randy Brown

On October 17, the Directors approved a significant program revision. Pat Coulston, Program Manager, is preparing a report describing the revision in detail. The following are some of the highlights. One of the guidelines going into the revision process was that we would recommend a program that maintained a level budget. We also listed some studies or elements that should be funded if additional money were made available. The Directors stayed with the level budget, and Interagency Program staff and the water contractors will be working to bring in additional funds to cover some of the unfunded, but important, elements.

Before going into the program itself, it may be helpful to provide an idea of the origin of this year's funding and the total amount available. It is always difficult to lay out the actual program budget for the upcoming year, mainly because two fiscal years (federal and state) are involved. Federal budgets for FY 96 have not been established yet, so the following values for federal contributions are estimates.

Department of Water Resources	\$ 6,000,000
U.S. Bureau of Reclamation	3,375,000
U.S. Geological Survey	966,000
U.S. Fish and Wildlife Service	220,500
Department of Fish and Game	1,345,000
CVPIA (U.S. Department of Interior)	100,000
Contra Costa Water District	35,000
Total	\$12,041,500

Base Monitoring Program

- Midwater trawl survey.
- Chinook salmon monitoring from near Hamilton City through the delta and to include funding a portion of the ocean salmon tag recovery program.
- The bay fish and invertebrate surveys.
- Water quality monitoring surveys as modified from Decision 1485.
- Hydrodynamic monitoring.
- Resident fish monitoring.
- Suisun Marsh fish monitoring.
- Numbers of fish salvaged at the SWP and CVP intakes.

Special Studies

Following are some of the special studies planned for the next 12 months.

- An expanded version of the real-time monitoring. In May and June 1995 we showed it can be done; now we have to determine if the data can be used in a more typical water year to operate the projects to protect fish and provide for water supply reliability.
- A study at Knights Landing to determine if we can obtain reliable estimates of the numbers of chinook salmon entering the delta.
- Marking about 1 million fall-run salmon from Coleman Hatchery and releasing three groups of them upriver to determine if these fish can be used to obtain better estimates of through-delta salmon survival. The idea is that these salmon will have had a chance to become more like wild fish than salmon released directly into the delta from the hatchery trucks.
- A 20-millimeter fish survey to determine if a new gear type is better able to capture delta smelt and other fish in the range of 15-50 millimeters.
- A program to evaluate the benefits of including a more structured community monitoring program as part of the baseline monitoring program.

What is Not Included in the Revised Program

Following are some elements that are not part of the approved program.

- An evaluation of fish screen approach velocity criteria using a fish treadmill.
- Predator removal from Clifton Court Forebay. Indications are that striped bass freely exchange between the forebay and the delta, and removal would not be effective.
- The agricultural diversion fish entrainment study. We will analyze and publish results of the first 3 years of study before deciding where to go next.
- Almost all sampling of eggs and larvae. Again, we will analyze the data before doing any more of this work. (Exceptions will be small studies required in biological opinions, such as the one for the North Bay Aqueduct.)
- An evaluation of the fish barrier at the head of Old River. We are waiting for an acceptable study plan before beginning this important study. Much of the funding will come from DWR as part of its interim south delta program.

Significant Decisions About Program Structure

- Retain the Management Advisory Group and improve the way it is used.
- Retain the Science Advisory Group and improve the way it is used.

- Work with staff to develop a more effective means of keeping track of the interagency budget.
- Develop, publish, and use quality assurance/quality control, study design, and peer review processes to enhance the quality of our data and information.
- Establish a data users' project work team to help make data more readily available to program staff and others.
- Establish a contaminants project work team to help sort out the role of toxic materials in controlling the abundance and distribution of key populations and communities.
- Integrate representatives of the stakeholders into the project work teams.
- Coordinate the Interagency Program with other monitoring activities such as the San Francisco Estuary Institute, Category III, and the Central Valley Project Improvement Act. This should lead to better understanding of factors affecting fish and wildlife in the estuary.

We have a lot of work to do to convert the recommendations into actual field and analytical work. One of the first challenges will be to design and implement the expanded real-time monitoring program. Thanks to the management team, program staff, coordinators, and stakeholder representatives, we have made major strides in changing and improving the program over the past several months. We must continue to move forward.

Brackish Water Species Benefit from High 1995 Flows

Kathy Hieb

Preliminary catch data indicate that species that depend on brackish water (intermediate salinity) have benefited from the high winter/spring outflow. As of September 1995, young-of-the-year longfin smelt catches were the highest since 1982. In July, we also recorded the highest single-station catch of young-of-the-year longfin smelt since the study began: 3,593 at the Red Rock station, just downstream of the Richmond-San Rafael Bridge. Young-of-the-year longfin smelt were concentrated in Central Bay and lower San Pablo Bay, with fish collected upstream to Chipps Island. Pacific herring young-of-the-year catches were comparable to 1993 but remained below predrought levels. This year may be similar to 1983, when Pacific herring larvae were carried outside the bay by outflow, and a large portion of the year class apparently reared in the ocean. The May-September young-of-the-year starry flounder catch was the highest since 1983, when the long-term abundance decline started. Although the catch of 72 young-of-the-year starry flounder is low relative to many other estuarine species, it is well above the 1987-1994 mean of 13 for the same months. Young-of-the-year starry flounder were concentrated in San Pablo and Suisun bays, with a few collected in the lower Sacramento River.

Although near-shore ocean temperatures returned to normal in 1994 and 1995, species that respond positively to warm water, including California halibut and Pacific sardine, con-

tinue to be relatively abundant in the bay. In contrast, the 1995 year class of Dungeness crab, which responds positively to "normal" ocean temperature, is poor. Frequent, intense storms in 1995 produced a strong northward flow, which is not favorable for retention of Dungeness crab larvae and megalopae in the Gulf of the Farallones. Abundance of megalopae in the gulf has been positively correlated with subsequent abundance of 0+ crabs in the bay.

Tracking Introduced Crabs

Kathy Hieb

Although we have yet to collect any Chinese mitten crabs, a substantial number of juveniles have been collected this summer in the freshwater reaches of Guadalupe River, Alviso Slough, and the Alameda Creek flood control channel (all in South Bay) by Kathleen Halat, a University of California, Berkeley, graduate student. Her highest estimate of density was about 10 burrows/square meter, with more than one crab possibly occupying a burrow. Last winter, shrimp fishermen collected ovigerous mitten crabs in the channels of South and San Pablo bays.

In 1995, we planned to determine the depth distribution of the green crab by season, sex, and size, with the goal of designing a survey to monitor their relative abundance and distribution. As of September, we have designed, built, and field-tested crab traps and determined that they collect significantly more green crabs than do baited ring-nets. Green crabs are abundant in South Bay, especially south of the San Mateo Bridge. In fall 1994, they were abundant in San Pablo Bay, but their distribution apparently shifted in response to the high outflows in early 1995. We have not collected many juvenile crabs at any of the sampling locations except Redwood Shores Lagoon.

Tidal Marsh Pilot Fish Studies Capture Splittail

Kathy Hieb

Site selection and development of sampling methodology has been the focus of 1995 work. We have tested block-nets, cast-nets, minnow traps, and beach seines. Sample sites are in the lower Petaluma River, where mature, young, and restored marshes are within a short distance of each other. This year these marshes are brackish, with salinity at the Sonoma Land Trust Marsh ranging from 7 parts per thousand in April to 17 ppt in August.

Catches have been dominated by yellowfin goby, longjaw mudsucker, splittail, threespine stickleback, *Tridentiger* spp, and striped bass. With the exception of the Rush Creek Unit, which is a managed marsh, young-of-the-year splittail have been collected at all of the sites. This includes the Green Point Unit, Rush Creek just downstream of the Rush Creek Unit, the Petaluma River Unit, and various sites along the lower Petaluma River. Splittail have been collected by all gear types from a variety of habitats, ranging from small, first-order channels to shallow water over mudflats.

No Striped Bass 38-mm Index for 1995

Lee Miller

Every summer since 1959, juvenile fish surveys have provided an index of young striped bass abundance. Beginning usually in June, we sample the population every 2 weeks until the mean size of the catch exceeds 38 millimeters. Then we interpolate between the last two surveys to estimate abundance when the mean size is 38 mm. This year's high flows and cool weather prolonged striped bass spawning and resulted in recruitment over all five surveys. Hence, the mean size did not progress as expected. Mean size was 25.2 mm for the third survey, 32.6 mm for the fourth, and 33.4 mm for the fifth. Since only 56 fish were caught on the fifth survey, perhaps because of gear avoidance, we decided to quit sampling, even though the index size had not been reached.

Usually, the 38-mm index is attained in three or four surveys, although five have been required in some high-flow years. Although no 38-mm index was obtained, abundance appeared to be low, considering the high flows. The third survey index was only 22.2, the fourth was 10.6, and the fifth was only 1.8. The 38-mm index has historically ranged from 4.6 to 117.3

In 1966, we had no index because no boat was available for sampling. In 1983, high flows moved fish downstream of our sampling area, resulting in a severely biased, invalid index. The September midwater trawl survey crew observed few striped bass downstream of Carquinez Strait, suggesting that this bias did not occur this year.

Juvenile Sturgeon Set-Lining

Dave Kohlhorst

To develop an index of year-class strength for white sturgeon, in late August, we attempted to fish baited set-lines for juveniles at 20 sites from the western delta to San Pablo Bay. Because of a boat breakdown, only nine sites were sampled. A total of 67 white sturgeon were captured, which is similar to the number caught at the same sites in 1991, the last time enough bait was available to sample with set-lines. A major difference between 1991 and 1995 is that almost no fish less than 85 centimeters were caught this year; in 1991, 58 percent of the catch was less than 85 cm. Apparently, white sturgeon production has been poor for about 10 years, corresponding to the recent drought. This is consistent with other evidence that white sturgeon reproductive success is best in high-outflow years.

Low *Neomysis* Abundance in Recent Years

Jim Orsi

Abundance of *Neomysis* has been low since 1993, when an exotic species of *Acanthomysis* became abundant in Suisun Bay. Peak monthly abundance of *Neomysis* was 7 m⁻³ in Suisun Slough in May, 6 m⁻³ in the entrainment zone in June, and 1-3 m⁻³ in the entrainment zone in July. These values are 1-2 orders of magnitude lower than before the arrival of *Acanthomysis*.

Acanthomysis was an order of magnitude more abundant than *Neomysis* in these months and rose from May to July, instead of declining. Peak abundance was 10 m⁻³ in the entrainment zone in May, 21 to 25 m⁻³ in June, and 33 m⁻³ in July.

Acanthomysis appears to carry more young at equivalent sizes than *Neomysis* does. Competition almost certainly occurs between them, and *Neomysis* abundance will likely be affected as long as this is the case.

A paper describing *Acanthomysis* as a new species was in progress when the senior author died. Dr. Tom Bowman, of the Smithsonian Institution, possessed an unrivaled knowledge of crustacea and will be difficult to replace.

Pseudodiaptomus forbesi was the dominant copepod in the estuary in June, the last month for which data are available. *Sinocalanus* abundance was low. *Bosmina* was displaced downstream from the eastern delta to the western end of Sherman Island.

Zooplankton abundance at Stockton was unusually low in June, probably because of the high outflow in the San Joaquin River.

No new introduced species have been detected this year, but the ballast water issue continues to attract interest. Three requests for information have been received this year, two by people writing reports or articles on the issue. The *Newsletter* published our article on introduced species, which was distributed at a meeting of the San Francisco Estuary Project. In July, the Freshwater Foundation started a newsletter devoted to aquatic nuisance species, and a report on the introduction to Chesapeake Bay of nonindigenous species via ballast water appeared in January. Support is growing for national and international control of ballast water releases.

Low Dissolved Oxygen Conditions in the Stockton Ship Channel

Harlan Proctor

Dissolved oxygen levels in the eastern portion of the Stockton Ship Channel historically drop to below 5.0 mg/L during late summer and early fall, mainly due to low flows (1,000 cfs at Vernalis is common) and high biochemical oxygen demand. In August and September of this year, however, Vernalis flows of 4,000-5,000 cfs have maintained positive net flows in the ship channel. Despite improved flows, dissolved oxygen at the bottom was 4.0-5.0 mg/L from Turner Cut to Rough and Ready Island. Surface dissolved oxygen remained above 5.0 mg/L except in the midreach of the bottom sag, where it dropped to 4.8 and 4.5 on two occasions in August. Conditions improved in September, with dissolved oxygen of at least 5.0 mg/L at all sites. Due to the high sustained flows, no temporary barrier will be installed at the mouth of Old River this fall.

Fall Sampling Planned for the Asian Clam, *Potamocorbula amurensis*

Harlan Proctor

In the fall of 1990 and 1993, we sampled 214 sites to estimate the spatial distribution of the accidentally introduced Asian clam, which was first discovered in 1986. The 1990 survey demonstrated a nearly solid distribution west of the delta; some Suisun Marsh sites had as high as 19,200 clams per m². Following the first year of high flow since the clam was

introduced, the 1993 survey showed a westward shift in abundance and higher recruitment downstream relative to 1990.

In May 1995, a survey of 43 sites showed distribution patterns similar to those in 1993, with less dense populations (up to 3,700 clams per m² in Suisun Slough and Montezuma Slough). High densities of juvenile clams were still found in San Pablo Bay shoal areas. This fall's survey will document current density in response to the prolonged freshwater flows, as well as any changes in their distribution and population structure.

New Delta Channel Flow Measurement Capability

Rick Oltman

During August, we installed an ultrasonic velocity meter (UVM) flow monitoring station on the San Joaquin River at Stockton (0.5 mile north of Highway 4 crossing), with funding provided by the City of Stockton. The site is operational but has not yet been calibrated.

A UVM flow monitoring site is being installed on Dutch Slough, with funding provided by USGS. The instrument shelter and transducer piles were installed in September, and data collection should begin in October.

During the high flows of January and March, transducer mounting piles were destroyed at several UVM sites. During August, steel replacement piles were driven at three sites: San Joaquin River at Jersey Point, Sacramento River upstream of the Delta Cross Channel, and Sacramento River at Rio Vista. The Rio Vista site is new and consists of two UVMs, one on each bank of the ship channel. The right bank UVM has been operational since late April; the left bank UVM had a pile destroyed in March. Once the sites have been repaired and are again operational, the UVM flow monitoring network will consist of nine sites, four of which will monitor delta outflow.

Hydrodynamic Model Development

Francis Chung

DWR continued development of a one-dimensional computer simulation model of the delta. The new model is composed of three major components: a hydrodynamics module (DSM2-HYDRO), a water quality module (DSM2-QUAL), and a particle-tracking module (DSM2-PTM). The DSM2 model will also include several pre- and post-processors, including a graphical user interface, a boundary tide and salinity predictor, a land use module for generating agricultural diversion and return volume estimates, and a trihalomethane formation potential module. The hydrodynamics and water quality modules are derived from the USGS FourPt and BLTM models, respectively. Through license agreements, it is DWR's goal to eventually make DSM2 available free to the public. DWR is working closely with the Interagency Program hydrodynamics project work team and will provide uncalibrated prerelease versions for testing and peer review. A prerelease version of DSM2-HYDRO will be released to the work team pending resolution of legal issues. Prerelease versions of DSM2-QUAL and DSM2-PTM are expected to be released before the end of the year.

New Juvenile American Shad Indices and Winter-Run Salmon Monitoring

Pat Brandes

Between July 1 and September 30, we have been midwater trawling 3 days a week at Sacramento and Chipps Island to document the movement of juvenile shad migrating into and out of the delta for the Central Valley Project Improvement Act's Anadromous Fish Restoration Program. The data will be used to evaluate whether annual juvenile indices could be obtained using the midwater trawls at Sacramento and Chipps Island. Numbers of juvenile shad were substantial, especially at Chipps Island. A report is scheduled for release by January 1996.

Beach seining continued every week or two in the lower river and northern, central, and southern delta.

The Central Valley Salmon Project work team has met several times this summer to finalize plans for the 1995-96 monitoring work, use of the 130,000 marked late-fall-run post-smolts, and identifying and integrating other valleywide salmon monitoring plans into delta efforts for next year. Next month will be dedicated to determining the use of 800,000 marked fall-run smolts for experiments in spring 1996.

Although the core monitoring program in the delta has been identified, two special studies have been proposed, pending funding:

- A pilot effort at Knights Landing using two rotary screw traps, fyke nets and kodiak trawl to estimate absolute abundance of juvenile winter run (as well as other races) entering the delta.
- Tagging 1 million Coleman fall run and recovering them at Sacramento, Chipps Island, and other monitoring sites associated with the real-time monitoring effort. Smolts of known origin and at large enough numbers will be helpful in determining distribution of juvenile salmon throughout the delta.

Other special studies may be further developed for project work team, management team, and coordinator approval throughout the year.

Evaluation of Splittail Investigation Techniques

Randy Baxter

Splittail investigation this spring and summer focused on two general objectives:

- Determining effectiveness of various types of gear in capturing juvenile splittail in different freshwater habitats.
- Collecting and rearing juvenile splittail to evaluate spray dying as a marking technique.

Gear evaluation in the Sacramento and San Joaquin rivers began in June and will continue through early October. Gear being evaluated includes boat and backpack electroshockers, 30-, 50-, and 100-foot beach seines, minnow traps, cast-nets, and hook-and-line. Most sampling was during the day, but night sampling was also included. Beach seining still appears to be the most effective gear for young-of-the-year splittail, but its effectiveness diminishes as the fish grow.

In late July, about 200 fish were transferred from Clifton Court Forebay to large grow-out tanks at Skinner Fish Facility. Temperature was 22-24°C for most of the holding period but spiked at 31°C on July 28. Even with moderate salting of the tanks, all fish died of columnaris disease within 4 days of introduction. This experiment will be repeated next spring. In the interim, personnel will help spray-dye juvenile striped bass to familiarize themselves with the equipment and technique.

Plans are being developed for a study during winter and spring of 1996 to track splittail and identify their spawning habitats through the use of radio tags and telemetry.

Delta Smelt Investigations

Dale Sweetnam

Partly due to the wet year and subsequent low tow-net index, we decided not to do any special field studies. However, we did the 20-mm survey and tow-net survey and are doing the midwater trawl. A subsample of fish collected in the November kodiak trawl survey will be subjected to electrophoretic work to distinguish delta smelt from wakasagi.

DFG-Stockton is analyzing factors that may be responsible for size and weight differences in fish caught in summer 1994 by kodiak trawl upstream and downstream of Chipps Island. We will examine otoliths and stomach contents and will examine gonads. Preliminary results should be available in December.

The project work team will also be reviewing studies and research initiated in response to the listing of delta smelt. The review should be completed by March 1996.

Real-Time Monitoring

Leo Winternitz

A draft report describing results of the 1995 Real-Time Monitoring Program should be available by the end of October.

We have started planning for the 1996 program. The goal has been to develop a "straw" proposal, which the newly formed project work team will use to develop the full program. The straw proposal embodies several flexible strategies to minimize sampling expense, including wet year/dry year sampling schemes and sampling triggered by the occurrence of target organisms at other stations or in other surveys. As with the 1995 program, the 1996 proposal will coordinate as much as possible with other programs and surveys.

Delta Agricultural Diversion Evaluation

Katie Wadsworth

The 1995 agricultural diversion study began May 30 and ended August 31. We sampled at three sites during dawn periods. One fall-run chinook salmon (97 mm TL) was collected off Twitchell Island on June 19. No delta smelt were collected during the 1995 sampling.

A draft summary report of the 1993 and 1994 Lakos-Plum Creek self-cleaning fish screen evaluation is available.

North Bay Aqueduct Entrainment Monitoring

Jenni Lott

Larval sampling at four sites in the North Bay Aqueduct region was completed July 15. In the 264 samples, only two delta smelt were collected, the first on April 18 and the second on July 7. Apparently due to the high outflows and reduced exports, density of larval delta smelt was low in Lindsey and Barker sloughs, and pumping restrictions were not imposed.

Contra Costa Canal Intake Entrainment Study

Jerry Morinaka

We used a sieve-net to sample fish entrainment every fourth day at the Contra Costa Canal (on the discharge side of Pumping Plant 1) during July and once a week during August and September. The predominant fish species captured in July was striped bass (30 mm mean fork length) and in August was white catfish (48 mm mean fork length). Considerably fewer juvenile splittail were captured in July and August than in June. No chinook salmon, delta smelt, or longfin smelt were captured during any of the sampling.

Mallard Slough Monitoring Program

Jerry Morinaka

Once in July and once in August, we monitored for larval fish at the intake channel of the Mallard Slough pumping plant and outside the channel in the Sacramento River. No larval delta smelt were captured in the intake channel during either effort. In August, Contra Costa Water District discontinued use of Mallard Slough pumping plant, so there will be no monitoring there until the facility is back in operation.

Fish/X2 Relationships

Wim Kimmerer

During the last quarter, the estuarine ecology team examined probable mechanisms underlying the "fish/X2" relationships, which form the basis of salinity standards for the bay and delta. These relationships probably occur through several mechanisms leading to the same result for most estuarine-dependent species: more flow means more fish. Given the wide variety of trophic levels and life histories of the species having positive relationships to flow, the mechanisms likely operate at different times and places, and on different life stages, for each species. The estuarine ecology team determined which mechanisms were most likely to operate for which species, based on experience of team members and knowledge of life histories, habitats, and details of the relationships. A summary report will describe the most probable mechanisms behind these relationships and the studies required to determine which mechanisms are actually operating.

San Luis Reservoir Survey

Lloyd Hess and Scott Siegfried

O'Neill Forebay and San Luis Reservoir were surveyed during August. The goals for the 1995 survey were to:

- Document survival of juvenile splittail in O'Neill Forebay.
- Document reproduction of wakasagi in San Luis Reservoir.

Both goals were accomplished. Large numbers of young-of-the-year splittail were observed in the complex this year. During 1994, when there was minimal splittail reproduction in the delta, splittail were not observed. Splittail reproduction was very successful in the delta during 1995, and large numbers of young-of-the-year splittail were observed in O'Neill Forebay. The question remains whether these young-of-the-year splittail will reside in the O'Neill Forebay/San Luis Reservoir complex or try to migrate from the system.

An abundant population of 80-90-mm wakasagi was found in San Luis Reservoir. Scale analysis indicates these fish were young-of-the-year. Delta smelt were not observed.

Large numbers of both delta smelt and wakasagi young-of-the-year were observed at the SWP and CVP fish facilities in 1994 but they were not observed at the fish facilities in 1995. For more information on the San Luis, see page 15 of this issue.

Handling and Trucking Study at Skinner Fish Facility

Scott Barrow

The draft study plan is being reviewed. Preliminary experiments with splittail were stopped due to personnel constraints. Only one preliminary splittail experiment was completed, in which we measured about a 25% mortality rate due to trucking. The fairly high water temperature (mid-70°F) during the experiment could have caused the high mortality.

Clifton Court Forebay Plant Debris

Scott Barrow

Initial surveys of the area of Clifton Court Forebay treated with herbicide in May showed rapid regrowth of aquatic plants. In August, the herbicide Komeen was reapplied to about 600 acres — the original 300 acres in southern Clifton Court Forebay plus an adjoining 300 acres. The herbicide was applied with a helicopter by licensed applicators, and water exports were curtailed during the application period. Preliminary results indicate the treatment was successful. DWR Delta Field Division is preparing a report.

Clifton Court Forebay Striped Bass Sonic Tracking Program

Kevan Urquhart

Efforts to document the movement of adult striped bass into and out of Clifton Court Forebay using sonic tags, fixed tag-monitoring stations, and mobile tracking have been effective. Preliminary data analysis shows that 31 of 48 sonic-tagged striped bass originally tagged in the forebay were tracked across the radial gates. Of these, 20 were subsequently tracked in the forebay. Of interest, one fish was tracked inside Clifton Court Forebay with a "coded" tag, presumably one of the sonic-tagged splittail from Tracy Fish Facility. Eight fish tagged near the radial gates were later monitored at the Skinner Fish Facility trash racks. No fish have been located outside the forebay with mobile tracking.

The unattended monitoring site at the radial gates now consists of three stations and four hydrophones and is operated around the clock. Another station adjacent to the Skinner Fish Facility trash racks is also operated around the clock. Mobile tracking has been facilitated through use of a series of prototype hydrophone fairings, which allow monitoring at speeds to about 12 mph (a 1200% increase from an infrared hydrophone).

Several tags have been recovered from dead fish, and anglers have also returned tags. Early in the study, high water temperatures (>80°F at the surface) and subsequent stress from handling and tagging probably caused the known loss of several tagged fish. After those mortalities, sampling was limited to late evening and early morning, with no known mortality due to handling. High water temperature and poor water quality at Skinner Fish Facility have precluded maintaining a control group. Vigorous, untagged fish could not be maintained more than a few days.

Status and Trends

The winter issue of the Interagency Newsletter will be devoted to a review of the status and trends of some important organisms living in or moving through the estuary and some of the chemical and physical parameters that affect their distribution and abundance. The issue will be long on graphical displays of the data and short on text that attempts to tell us why the trends have occurred. Looking at "why" will be the subject of technical reports on the individual organisms and parameters. We hope this will be a useful exercise, and, if it is, we will make it an annual feature of the Newsletter.

We welcome suggestions as to which organisms and parameters should be covered in the status and trends issue. Send suggestions to Randy Brown via fax (916/227-7554) or email (rbrown@water.ca.gov) or phone (916/227-7531).