Science Advisory Group Lauds Interagency Monitoring

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As part of our efforts to adapt to changing priorities, increase our efficiency, and organize our diverse data sets into formats more easily accessible, the Coordinators, management group members, and water contractor representatives met with the Science Advisory Group for 2 days of workshops on July 27 and 28. The specific purpose was to review the Long-Term Trend Monitoring program.

The Science Advisory Group is composed of seven scientists representing agency (USGS) and academic institutions (University of Maryland, University of California, University of Arizona, and Stanford University). At the conclusion of the workshop, the Advisory Group presented a report discussing six recommendations for the Long-Term Trend Monitoring:

- Expand the resources allocated to data analysis, synthesis, and dissemination.
- Maintain sufficient comparability in its measurement methods that trend analyses can take advantage of the entire historical record.
- Consider expansion of its present geographical boundaries.
- Begin to consider changes necessary to move toward a more community-based monitoring program.
- Consider "ecological health" of the bay/delta in use of Interagency Program data, but be aware that substantial effort has been expended by other programs in developing such indices, generally with little in the way of useful results.
- Be aware that communication, coordination, and collaboration will be keys to the future success and viability of long-term Interagency Program monitoring.

In addition, the Science Advisory Group commented that although many complex ecological questions remain unresolved, the bay/delta ecosystem is one of the best understood and most comprehensively studied estuarine ecosystems in the United States and that this is a result of Interagency Program monitoring and special studies. The advisory group also recognized that Interagency Program data are the basis for the public's growing awareness of bay/delta resources, that the Interagency Program has been critical in detecting the arrival of exotic species and understanding their effects on the ecosystem, and that the Interagency Program is the basis for environmental standards to protect the ecosystem.

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Winter-Run Chinook Salmon Captive Broodstock Program 1995 Progress Report

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In response to critically low levels of winter-run chinook salmon in the Sacramento River during 1991, the Winter-Run Chinook Salmon Captive Broodstock Committee was initiated. Once numbering more than a hundred thousand spawning adults, returns had plummeted to 191 fish. To help save this unique and important salmon stock from possible extinction, several state and federal fishery agencies joined with commercial and recreational fishing interests, water users, and the academic research community to develop and implement a captive broodstock program. This coalition worked, by consensus, to develop its goals.

The primary goal of the captive broodstock program is to prevent the loss of the genetic resource contained in the winter run genome should the wild run become extinct. A secondary goal is to help prevent extinction by producing gametes that can be fertilized by wild fish gametes collected as part of the Coleman National Fish Hatchery winter run propagation program. The goals are to be met by rearing winter-run chinook salmon under controlled conditions until they become mature adults. Mature salmon would then be used as hatchery broodstock for continued propagation of the race.

The captive breeding program provides insurance against extinction and loss of genetic material, a source of eggs and sperm for the Coleman winter-run propagation program, a source to supplement naturally the remaining spawning salmon, a means to "buy time" until habitat conditions improve in the Sacramento River, an egg and fry source for experimental studies, and a way to maximize options for the recovery of the species.

The captive broodstock program plans to assist in winter-run salmon recovery by:

- Holding up to 1,000 juvenile winter-run salmon propagated at Coleman Hatchery in captivity each year;
- Transferring those juvenile salmon to fresh and salt water rearing facilities at Bodega Marine Laboratory and Steinhart Aquarium at the California Academy of Sciences, San Francisco;
- Raising the fish for 2-5 years (until maturity);
- Returning the adult salmon to Coleman Hatchery to be spawned;
- Using the resulting gametes to increase the winter-run population.

A genetic research and management plan was developed to:

- Ensure that the effective population size of the winter-run was not reduced by artificial propagation, and
- Manage the Captive Broodstock Program to conserve genetic resources.

To achieve these goals, the committee had to respond to several challenges. One of the most difficult was disease control. In addition to expected problems such as bacterial kidney disease, a previously undescribed pathogen in the winter run termed rosette agent — a systemic protist — appeared in the 1991 broodyear. Infection with this parasite resulted in substantial mortality in the 1991 cohort. Long-term treatment methods for these pathogens required development of new care and feeding strategies in addition to new disease detection methods.

The program was put under a year-long quarantine while field investigations in the Sacramento River were initiated. In 1994, the rosette agent was found in wild fall-run chinook. This discovery lifted the quarantine on the captive broodstock gametes, and about 30,000 eggs were delivered to Coleman Hatchery in 1995. Current research focuses on nutrition and maturation to increase fertilization rates.

Funding for the broodstock program has been provided by: U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, National Marine Fisheries Service, Department of Water Resources, Department of Fish and Game salmon stamp program, and the National Fish and Wildlife Foundation. Category III, resulting from the 1994 Bay/Delta Agreement, will provide funding in 1996. Implementing agencies are: U.S. Fish and Wildlife Service, Coleman National Fish Hatchery, California Academy of Sciences, Steinhart Aquarium, University of California-Davis, Bodega Marine Laboratory. In 1993, Congress authorized the winter-run captive broodstock program at a level of $1 million annually.

After 4 years, the broodstock program has:

- Rapidly established interagency/project coordination;
- Built rearing facilities at Bodega Marine Laboratory and Steinhart Aquarium literally around the juvenile salmon as they were being raised;
- Developed long-term feeding and rearing strategies;
- Developed pathogen detection methods and fish health management protocols to improve survivorship;
- Provided original genetic research resulting in a method using existing technology to identify the gender of a juvenile salmon and provision of genetic management direction to the broodstock;
- Provided about 30,000 salmon eggs to Coleman National Fish Hatchery.

The broodstock program is holding in captivity:

Bodega Marine Laboratory
- Brood year 1991 52 adult salmon
- Brood year 1992 25 maturing salmon
- Brood year 1993 249 year-2 salmon

Steinhart Aquarium:
- Brood year 1993 256 year-2 salmon
- Brood year 1994 619 yearling salmon

As it approaches the half-way mark, the 10-year Winter-Run Chinook Salmon Captive Broodstock Program has overcome many developmental problems, has established the infrastructure necessary to continue at full production status, and can do so until the program is no longer necessary. Most importantly, this program will contribute to the recovery of this unique salmon stock.