Central Valley Salmonid Satellite Project Work Team -
Juvenile Monitoring Project Work Team

Draft Meeting Notes
January 18, 2006
Department of Water Resources Building - Oroville Complex

Participants: Bill Poytress (chair-FWS), Felipe Carrillo(FWS), Richard Corwin (USBR), Ryon Kurth (DWR), Jason Kindopp (DWR), Matt Brown (FWS), Colleen Harvey-Arrison (DFG), Kellie Whitton (FWS), John Williams (Consultant/UCD), Holly Herod (FWS), Martin Koenig (Jones and Stokes), Michael Marshall (FWS), Jason Hanni (FWS), Dennis Blakeman (DFG), Michelle Workmann (EBMUD), Joe Johnson (DFG), Robert Vincik (DFG), Tracy McReynolds (DFG), and David Colby (FWS).

I. Introductions and Announcements. No announcements.

II. Modify/Adopt draft meeting notes from 8/31/05 – Notes were adopted with no additional changes.

III. Modify/Adopt agenda – No modifications/agenda adopted.

III. Discussion topic: Lamprey Data Request and Brief Discussion.

B. Poytress and **H. Herod** discussed the lamprey data collaboration project, an effort to get JMPWT members to submit summarized data of lamprey by-catch from monitoring stations throughout the Central Valley. The idea is to create a poster presentation for the 2006 AFS Cal-Nevada Chapter Conference. **B. Poytress, H. Herod** and **J. Hanni** passed out examples of summarized lamprey data that they had summarized from their projects. The solicitors asked for input as to what data could be presented that would have the most utility in describing the temporal distribution patterns of lamprey that are caught (typically as by-catch) at various monitoring stations in the Central Valley. **M. Workmann** noted that she had presented her lamprey data at the 2005 AFS lamprey symposium in Sacramento, Ca. Discussion ensued as to how to describe relative abundance and distribution using various datasets. The final result was that a specific request would be made to JMPWT members to submit data in the coming days as a simple fork length distribution by species. The aspiration is to have a more extensive dataset including some measure of relative abundance as well as seasonal and temporal distribution patterns to be written up at a later time and potentially presented at the 2007 AFS conference. Please contact Bill Poytress (530.527.3043) or Jason Hanni (209.946.6400) for more information.

IV. Discussion topic: Juvenile Salmonid Emigration Patterns.

a) John Williams (Consultant/UCD) –*Literature Review of Pre-1960's data, recent data, graphics and hatchery vs. wild fish data.*

John presented historic fyke net data from 1899 (found in Rutter 1904) noting that the data showed little variation in size class, gear bias is one hypothesis. He indicated that most juvenile Chinook were noticed to be caught at night at Balls Ferry and around the clock in Georgiana Slough, probably due to hydraulic mining that was occurring in the Feather River drainage resulting in much sedimentation downstream (i.e. highly turbid conditions in Delta). He noted the catch rate was fairly consistent at Georgiana Slough.

John continued with Hatton and Clark's 1939-1941 fyke net sampling at Hood and Mossdale, noting that catch increased in early March and then declined sharply in April (Hood site). Mossdale fyke sampling showed that abundance increased in late February. John estimated these fish were likely San Joaquin spring run and the size distribution increased greatly later in the season. Sampling was also conducted in Martinez.

Erkkila at al (1950) [data rarely referenced] demonstrated spatial distribution of juvenile salmon sampled in the Delta via tow net. Sampling occurred prior to the installation/operation of the south Delta pumping facilities. John pointed out that salmon were widely dispersed and that San Joaquin tow net sampling caught salmon late in the spring time.

John then spoke of representation of data in graphic format. His first example depicted migration rates of cwt Chinook released at Coleman National Fish Hatchery and collected at Chipps' Island trawl. The data, in box plot form, showed the high degree of variability of the data. John noted that the data needs to be analyzed, besides being collected and graphed. John then looked at some graphics of Butte Creek wild fish migration to the Sutter Bypass (2002 data). He noted many migrated quickly as fry and then another set migrated slowly as smolts.

John went on to discuss scatter plots, using Gaines' catch data scatter plot showing catch with length-at-date curves overlayed. He noted that with the extensive number of data points that much data is superimposed and the data blurs together. John then spoke of the Gaines and Poytress (2004) report that shows a graphic of winter Chinook fork length distribution box plots showing outliers. He noted that the outliers may cause the reader to lose the point of the graph.

John's next graph example was of adult escapement data (Kostow 2004) showing grouped bars of hatchery and wild salmon returns to the Upper Sacramento River by year. The side by side annual comparison exhibits the data trend well. John also pointed out another graph from the same report noting that by using a variety of symbols (triangle, square, circle) that the data is easy to view and understand.

John noted from adult escapement data graphics (GranTab) that Battle Creek returns appear to overtake returns to the Mainstem in recent years. Assuming that the Battle Creek and Sacramento River returns reasonably reflect the hatchery and naturally produced fractions of the run, this indicates that hatchery fish are replacing naturally producted fish rather than augmenting them. He noted this is situation was also shown in a stream in New Zealand.

John concluded his presentation with the following points:

- Management actions as experiments are the essence of adaptive management.
- In this context, monitoring is getting the experimental results.
- Adaptive management abolishes the distinction between monitoring and research.

References:

Erkkila, L. F., Moffett, J. W., Cope, O. B., Smith, B. R., and Nielson, R. S. Sacramento - San Joaquin Delta Fishery Resources: Effects of Tracy Pumping Plant and Delta Cross Channel. U.S. Fish and Wildlife Service 1950. 120 pp.; Special Scientific Report: Fisheries No. 56. 1950.

Hatton, S.R., 1940. Progress report on the Central Valley fisheries investigations, 1939. California Fish and Game 26: 334-369.

Hatton, S.R. and G.H. Clark, A second progress report on the Central Valley fisheries investigation. California Fish and Game 28: 116-123.

Kostow, K.E., 2004. Differences in juvenile phenotypes and survival between hatchery stocks and a natural population provide evidence for modified selection due to captive breeding. Canadian Journal of Fisheries and Aquatic Sciences 61: 577-589.

Rutter, C., 1904. Natural history of the Quinnat Salmon. Bulleltin of the United States Fish Commission 22: 65-142.

b) Michelle Workmann (EBMUD) – *Comparison of Movement, Habitat Use and Diets of Mokelumne River Hatchery and Wild Juvenile Salmon.*

Michelle began her presentation with the question: Do hatchery and river biologist goals conflict? Michelle noted the goals of the Mokelumne River hatchery as increasing survival of production and decreasing straying rates. The river biologists' goals are to increase/maximize natural production. Michelle spoke of recent fish community surveys they were conducting targeting every species in the river. Her group studies main channel and off channel habitats using a variety of methods (RST, seine, e-fish…).

Michelle also spoke of their rotary trap operations and changes in recent years to the sampling design (i.e. location and effort). Between 1995-2003, two 8-foot traps were located right below the Woodbridge Dam. In 2004, due to dam construction the two traps were moved downstream, yet still above the bridge. In 2005, they removed one trap and moved the remaining trap further downstream (below the bridge).

Michelle then spoke of the hatchery's volitional release experiments in 2003 and 2004. Noting that in 2003 with steady flows the hatchery fish took roughly a month to pass the RST. In 2004, a pulse flow experiment was tried and movement of hatchery fish past the RST took approximately 2 weeks, a sizable difference.

In terms of the fish community surveys, the hatchery fish have been found to be larger (fork length) than wild fish in the last three years of study. During high water years the

fish appear to move out quicker. The fish, as they are sampled further and further downstream are found to be larger as they move. The hatchery fish were found, typically, to be in a later life-stage than comparable wild fish detected in the survey.

For the habitat use surveys, Michelle's group did not detect any fish in contiguous channels during the 2003 and 2004 surveys. During the 2005 survey, a high water year, wild fish were found in side channels. In terms of diet, they plan to identify food sources of wild and hatchery fish. The food items will be classed by size and species and the dry bio-mass will be calculated. **M. Brown** asked if they knew about the eating habits of hatchery fish. Michelle replied that they appear to be eating and keying in on zooplankton. She noted that zooplankton are likely brought into the hatchery raceways via Comanche dam water and that the salmon are feeding on them prior to and post release.

c) Robert Vincik (DFG) – *Knight's Landing rotary trap sampling and emigration patterns.*

Robert began his presentation with some background information stating that sampling has occurred at this site since November 1995. The primary objective is to gather data on the timing and abundance of Chinook salmon and steelhead migrating past this area. Data including life stage and races of salmon is collected too. Their emphasis is sampling winter Chinook. Currently they are providing data to the Data Assessment Team (DAT) weekly and sometimes more.

Robert noted that sampling, due to funding, occurs October through April. He noted that in some years winter Chinook appear as early as October and they peak in abundance in December declining through February. Fall Chinook appear in December and peak in February declining until sampling ends in April. Questions were asked about their proximity to the Yolo and Sutter bypasses. Robert/Joe Johnson (DFG) noted they are below where flows enter the bypasses. He noted that their traps are set up in tandem for side-by-side comparison. He noted they would like to set-up two more traps above and below the bypasses to see what effect the diversions have on fish movement.

Robert noted that turbidity is high most of the year [due likely to the Ridge Cut Canal Agricultural runoff that drains into the Sacramento 1.5 miles above their sample site]. Temperature has been found to be indirectly related to flow.

In terms of annual catch, 2005 data only, ~93% were of captures were fall run, 1.73% winter, 3.53% spring, and 0.6% late-fall run. Robert's group has noted that weight is directly related to fork length. Additionally, plotting data can show errors in the dataset.

In closing, Robert noted that in the future his group would like to close the gap between GCID and Knight's landing sampling by adding additional sample sites. Future water

project are coming and may be a way of obtaining funding for middle river monitoring efforts.

d) Bill Poytress (FWS) – *Recent Trends in Chinook Passage @ RBDD for Eight Non-consecutive Brood-years.*

Bill began his presentation by warning that the data to be presented by run is based on length-at-date criteria. Bill mentioned the data describes trends in juvenile Chinook passage at the Red Bluff Diversion Dam rotary trap sampling site for the period 1995-2000 and 2002-2004. He created vertical bar graphs with standard error and standard deviations noting monthly mean passage of each run and the percent of annual passage that occurs each month. Bill noted that winter Chinook appear to follow a normal distribution (bell-shaped curve) and winter Chinook data is the most reliable due to the relatively low number of sample days lost during their primary emigration period past RBDD (July-December, representing ~97% of annual passage). He noted that 51% of passage typically occurs during the month of September alone. Bill then noted while looking at weekly passage data that was overlaid with fork length data that winter Chinook pass primarily as fry and there is a jump in median fork length along with an increase in variability of fork lengths as passage slows in late October. Bill then detailed their trap efficiency model data noting that fry sized fish (<46 mm FL) used in mark-recapture trials seem to correlate the best in terms of the relationship used in their trap efficiency model. He continued, showing that the pre-smolt (>46 mm and <80 mm) size fish when used in mark recapture trials appear to show the weakest correlation in the model. His guess is that fish of this size are not actively migrating as much out of the upper Sacramento River. He then went on to show that larger smolt sized fish (>80 mm) appear to move out more actively and the relationship strengthens when this size fish is used in trials and incorporated into the model.

Bill continued describing spring Chinook emigration patterns noting that December appears to be the month of greatest annual passage (~32% of total passage). He cautioned that this may be an artifact of the length-at date criteria as this is when fall Chinook begin emigrating. He also noted that March and April are months of extensive passage, but he assumes many are larger unmarked fall run released from Coleman National Fish Hatchery in production releases. Bill then described the fall Chinook emigration patterns, emphasizing that January and February are the months of greatest annual passage. During this two month period approximately 70% of fall Chinook passage occurs. **M. Brown** asked what the annual passage of fall Chinook is estimated at. Bill replied that "ball park" figures are typically between 11 and 28 million per year. Late-fall passage appears to be slightly bi-modal with peaks occurring in May and July, although the passage data is highly variable.

Bill concluded by summarizing earlier trends noting also that race designation is a good tool, but he would like to get a level of comfort by analyzing morts held during periods of run overlap. As an example he noted that spring Chinook passage could be heavily influenced by late emerging winter run or early emerging fall run.

V. Tentative Agenda Items for the proposed April 12th meeting:

The proposed next meeting of the Juvenile Monitoring Project Work Team is Wednesday April 12th, the topic being data dissemination and storage (Who has what?, Who needs it? Where is it?, Should it be centralized?). The chair will attempt to get folks from RMIS, or IEP and others to present information on the topic. **NOTE**All who are planning on attending please bring a list of data sources that you use as well as where to access your reports/data. These report titles and websites will then be included in a draft list of data sources to be compiled and distributed to group members. Please include Internet URL's and report titles in your list.