Central Valley Salmonid Satellite Project Work Team:
Juvenile Monitoring
Meeting Notes from January 24, 2008
Yolo Bypass Wildlife Area, Davis CA 10:00

Participants: Bill Poytress (Chair; USFWS), Matt Brown (USFWS), Doug Threloff (USFWS), Felipe Carrillo (USFWS), Robert Vincik (CDFG), Richard Corwin (USBR), Robyn Bilski (CDWR), Colleen Harvey-Arrison (CDFG), Kellie Whitton (USFWS), Pat Brandes (USFWS), Paul Cadrett (USFWS), Joe Johnson (CDFG), John Williams, Ed Rible (EBMUD), John Montgomery (Cramer Inc.), Clark Watry (Cramer Inc.), Jack Ingram (USFWS), Zac Jackson (USFWS-AFRP), and JD Wikert (USFWS-AFRP).

I. Introductions and Announcements:
*Welcome newest participants Jack Ingram (USFWS), John Montgomery (Cramer Inc), Ed Rible (EBMUD), and Zac Jackson (USFWS-AFRP).
*The Upper Sacramento River Project Work Team annual meeting at the Red Bluff Fish and Wildlife Office is scheduled for 3/12/08. Please contact Richard Corwin (USBR) if interested in presenting information about research and monitoring activities, past, present or future.
*Approximately 72,000 adclipped winter-run are scheduled to be released at Caldwell Park (RM 298) in the upper Sacramento River on 1/31/08.

II. Modify /Adopt Agenda: No modifications, agenda adopted.

III. Amend /Approve prior meeting notes (10/25/07): No comments, notes finalized and soon available at the IEP Juvenile Monitoring PWT website.
(http://www.iep.ca.gov/central_valley_salmon/jm/notes.html)

IV. Brief Program Updates:

Erin Chappell (CDWR) [via email]: We are starting to see Chinook show up in the delta but loss at the Delta Fish Facilities remains low. We are mainly salvaging adclipped Chinook from the Coleman releases. The first steelhead of the season were salvaged last week.

Bill Poytress (USFWS): Red Bluff Diversion Dam rotary trapping is occurring with 4 traps. Catch is predominantly fall run fry, but older juveniles falling into the winter-run size class (90-100mm FL) are still trickling out of the upper river. Mark-recapture trials are being conducted with fish sampled from rotary traps and bismark brown stained fish are in the system.

Pat Brandes and Paul Cadrett (USFWS): Delta Action 8 experiments in progress. Chipps' Island trawls may be limited to 50 delta smelt / season as recommended by the Interagency Ecological Program (IEP). Additional projects this spring include paired fry releases at multiple locations. Typical annual smolt survival releases will *not* occur this

year due to low production of hatchery fish in response to relatively low escapement seen at the Feather River hatchery. Paul requested that those who feel Chinook salmon sampling is of significant importance to please voice support in light of Delta Smelt catch restrictions.

Robert Vincik (CDFG): Rotary trapping at Knight's Landing has been ongoing since October 2007. Sampling has been consistent and the traps have only been down for a few hours this season due to large woody debris. Recently they have been catching Coleman National Fish Hatchery released late-fall and steelhead along with fall run fry. An albino lamprey was recently sampled at the traps. Sampling is scheduled to continue through June.

Joe Johnson (CDFG): Recently been working on the Lake Davis Pike eradication project but will be transitioning back to juvenile monitoring. Looking to phase in the middle river rotary sampling sites this year or next.

John Montgomery (Cramer Inc): Caswell trap on the Stanislaus (RM12) recently re-installed, the first sample was collected on 1/23/08. Low flows in the Stanislaus resulted in minor difficulties in getting trap to sample properly.

Ed Rible (EBMUD): Rotary trapping on the Mokelumne is occurring with one trap above the Woodbridge Dam and one below. Some wildstock tagging is occurring using a single code.

Robyn Bilski (CDWR): One rotary trap in low flow channel (RM 061) and one in high flow channel (RM 038) since November. Low flow trap is catching between 1 and 10,000 fry/day. Recently began wild stock tagging by sub-contracting to BigEagle and Associates. Different coded wire tag codes are being used for batches of 10-12,000 fish. A new rotary trap began fishing on 1/9/08 in the high flow channel (RM 046). Rotary trap from high flow channel (RM 038) was moved to RM 046 on 1/14/08 and fishes tandem with the new rotary trap.

Colleen Harvey Arrison (CDFG): Deer and Mill creek rotary trapping sites are seeing considerably more yearling spring run this year. Deer creek site finally filled in with cobbles this year and a new site, ~250 yards upstream, will be sampled for the rest of the season. Young of the year fry are also being seen with yearlings.

JD Wikert (USFWS-AFRP): AFRP is funding fish physiology analyses to be performed on fall run from the Stanislaus, Tuolumne, and Merced Rivers by Scott Foote (USWFS-CNFHC). Fish health issues as noted at the October 25, 2007 JMPWT meeting are to be analyzed using this year's catch. Also, a coded-wire tagging trailer is not scheduled to be used for the upcoming years and may be available for use, see JD for details.

Richard Corwin (USBR): Red Bluff Diversion Dam pumps were shut down in December and no entrainment studies are occurring presently. Pumps may be returned to service as soon as February or as conditions warrant.

V. Group Discussion Topic: Review of Revised CAMP rotary-screw trapping protocol led by Doug Threloff (USFWS).

Doug started off with some background information on the Comprehensive Assessment and Monitoring Program (CAMP) via a MS Powerpoint presentation. He noted that while going through this everyone should think about how juvenile monitoring data can be used for multiple purposes in addition to project specific goals and objectives. Doug stated that the foundation of the CAMP is based on section 3406(b)(16) of the Central Valley Project Improvement Act, which states the Secretary of the Interior shall: "establish, in cooperation with independent entities and the State of California, a comprehensive assessment program to monitor fish and wildlife resources in the Central Valley to assess the biological results and effectiveness of actions implemented pursuant to this subsection." In 1997, in concert with CDFG and private contractors, the CAMP implementation plan was finalized. In the plan were two main goals, goal 1 dealt with adult escapement and will not be discussed in this forum. Goal 2 suggested that juvenile Chinook salmon should be monitored with RST's to assess the relative effectiveness of different categories of restoration activities. The plan highlighted the importance of collecting juvenile salmon data from 13 watersheds within the Central Valley. Moreover in 1997, CAMP finalized a protocol that describes how trapping activities with a RST could be done.

In the past couple of years Doug has been tasked with reviewing the available Central Valley rotary trapping information and from his preliminary review of 81 reports he noted the following…."data collection, analysis, and reporting procedures vary to a great extent, and there would be multiple benefits if agency staff provided input to and used, one comprehensive, updated and enhanced RST protocol". Subsequently, his current goal is to "Develop a comprehensive RST protocol that yields timely, scientifically-robust information that can be used to answer multiple questions. For example, are the relatively low adult Chinook salmon escapement estimates in 2008 due to fewer juveniles being produced in 2006?" Doug noted, "The advantages of using one updated, comprehensive protocol to collect, analyze, and report RST data include:

- Taking advantage of current innovations in the formulas that can be used to analyze data.
- Providing an enhanced ability to assess temporal trends within and among watersheds.
- Providing information that ultimately can be used to address multiple questions.
- Ensuring that, with relatively minimal added effort, comprehensive, robust data sets are collected when staff are in the field.
- Ensuring that the quality of data are evaluated and documented."

Doug mentioned that the 1997 protocol emphasized consistency in data *collection* not analysis and reporting. The 2007 protocol attempts to emphasize consistency throughout all aspects. **M. Brown** noted that he liked the 1997 protocol from the standpoint that it is

to be used as general guidance for trapping, as opposed to a mandatory protocol. Doug replied that the 2007 protocol is for guidance and covers most of what should be done. **J. Williams** responded that the *How* requires tuning and *What* is produced should be consistent. Doug stated comparability is the ultimate goal for a better data set to then analyze on a Basin-wide scale.

The presentation then focused on the four "key differences" between the 1997 and 2007 protocols. Each of the differences was then discussed in more detail and a subset of comments was captured and summarized.

1. Standardization of morphological features that are used to classify juvenile Chinook salmon.

Figures Illustrating Different Life Stages Of Chinook Salmon or Steelhead

Figures courtesy of Andrea Fuller, FISHBIO Environmental, LLC.

sac fry 	**fry** 	**parr** 
silvery parr 	**smolt** 	**parr (above) and fry (below) captured on same day** 

This particular topic generated a number of comments and application of this concept is currently inconsistent between projects. Some groups apply the 1997 classification system, some groups do not use the system as it is subjective with no quantitative standards, and others have expanded the classification system to further

classify fry (e.g., unbuttoned, buttoned, seam fry). Several people indicated that the silvery parr life-stage should be used for Chinook (leave in, as in 1997 protocol) not just rainbow trout/steelhead trout. **B.Poytress** noted that, especially in the life stage between fry and smolt, there sometimes appear to be "tank" or "tub effects" whereby fish held in a dark container exhibit more parr like pigmentation (i.e. blending or chameleon effect) and fish held in a light colored container exhibit more fry or silvery appearance. He noted that perhaps standardized equipment would help, but not completely alleviate this issue. Some members of the group appeared to have real concerns about the subjective nature of this qualitative measure and its utility. On the other hand, some noted that the appearance and notation of young of the year in the "sac fry" stage may have important implications in areas where active restoration activities are occurring. Increased or greater proportions or numbers of these types of fish in annual catches may indicate scour is occurring and juveniles are being prematurely flushed out of redds possibly resulting in lower survival of fish produced in these systems.

Also noted was that existing data using the 1997 protocol should be analyzed, where appropriate, to determine if any relationships exist between length and size class. Moreover, from some of the data presented (e.g., Appendix L of the 2007 draft protocol) it appears that there is a general temporal trend whereby fry and smolts are predominantly seen in distinct time periods and the intermediate size class/life stages are mixed with fry and smolts in a discrete time period at much lower numbers. Other sampling operations have noted the lack of parr or presmolt fish (45-60mm FL fish) in their samples and this may be due to negative bias of rotary traps to sample this life stage due to differing behavior at this life stage (i.e. not actively outmigrating, using margin habitat more). In streams with greater abundance of juvenile fish (i.e. 10,000 +/day) a sub-sampling protocol is usually implemented and only a subsample of fish are measured and classified with the information expanded to unclassified individuals.

2. *Standardized use of formulas and procedures that are used to analyze data.*

In recent years, directly applicable and robust equations have been assembled in an effort to generate abundance estimates from screw trap data. The equations found in the new AFS "Salmon Field Protocols Handbook" are currently being considered for adoption by CAMP as a means to allow direct comparisons of production estimates between watersheds. The handbook contains standard equations for using regression models to predict trap efficiency and standard equations for generating production estimates using a seasonal or monthly average, based on mark-recapture gear efficiency trials. Additionally, standard formulae for producing confidence intervals around production estimates are provided. Doug noted from the 81 reports he reviewed there were multiple methods used to calculate passage data and that some were likely better than others. **J.Williams** noted that standardized formulae may not work for all watersheds as sampling in each watershed may be trying to meet a variety of different assumptions. He suggested having Ken Newman (USFWS) or Eric Bjorkstedt (NOAA) analyze or produce ideal equations based on differing watershed sampling conditions. **B. Poytress** asked if it would be of value to have individual watersheds methods for creating production estimates and confidence intervals reviewed and employed if accepted by biostatisticians.

C. Watry stated that certain variables are better for prediction in various watersheds. **M. Brown** stated that some standardization is good, but across the board standardization not likely the best scenario. **Doug** thought that perhaps the development of a set of models as opposed to 13 watershed specific trap efficiency models would be acceptable. **M. Brown** recalled that the 2000 stats review of the RBDD and Stanislaus (Caswell site) quantitative methods were good for awhile, but upon a second later review the statisticians opinions changed. **J Williams** stated that trap efficiency varies by location and low efficiency values could be a serious concern.

From here a brief discussion regarding database use ensued and **Doug** asked the group if all projects were using MS Access. The majority of meeting attendees are currently using Access (via IEP) but some use Oracle (EBMUD) and Sequel Servers for larger applications (FWS-Stockton). **P. Brandes** noted that data collection is of primary concern and asked the group if specific methods (e.g. I.D of all fish species and length measurements) were being conducted by all projects. Most projects ID all fish (target and non-target), and typically a sub-sample of non-target fish are measured and the remainder counted. **Doug** also noted that he has a copy of the AFS manual in .pdf, email him if interested (doug_threloff@fws.gov).

15 Min Lunch Break

3. *Suggested use of data templates.*

Doug has assembled some standardized data reporting templates, but emphasized the most important point is the *data collection* not the format. Standardized data collection and perhaps storage was noted as being the key. **JD Wikert** noted that wild juvenile production versus hatchery production is another use of juvenile monitoring data. **Doug** asked the group about the idea and comfort level of posting or having raw data on the CAMP website. Overall, this was not responded to favorably as many have had issues with this concept with the IEP raw data vaults. Typically most have had others user improperly summarize raw data or draw incorrect conclusions from the data. It was noted that the "wheel" should not be reinvented as IEP has already done or tried this idea. The **group** appeared much more willing to provide appropriately summarized data or have specific data requests or information requests made directly to project managers. Another comment captured was the issue of unmarked and marked fish that could be wild or hatchery (e.g. unmarked hatchery or marked wild stock tagged fish). Standard nomenclature should be used to handle uncertainty. Overall it appeared that standard data templates may not be necessary, but standard information would be of value (i.e. weekly, monthly passage etc…).

4. *Assessment of data quality.*

The fourth main difference between protocols was the idea of "suggested use of graphics and narratives that a) describe the methods that are used to collect data, b) characterize the quality of data, and c) describe problems that were experienced in a given year." **Doug** stated that "explicit articulation" of sample days, crews (as it relates to morphology characterization), trap placement or site changes and how this relates to

quality would be ideal. **B. Poytress** proposed emphasizing sampling *effort* as a way to describe the quantity and quality of data collected and subsequent information produced. **M. Brown** stated it should be noted what sample days are missed intentionally versus unintentionally (e.g., storm related events) to better qualify data as well. He then asked what the goal is, annual production estimates or daily or other estimates? And does every daily detail *need* to be known?

The concept of how to deal with missed sample days was brought up. Currently, there is no standardized method for "interpolating" or inputting missed days data or information. Some groups take a weekly or monthly average, some average the days before and after missed events and some perform more exotic interpolations (e.g. rolling averages etc…).

In closing, **Doug** stated that the juvenile data being collected in the Central Valley is valuable. He would like to see that people get the most they can out of the data being collected or the effort being expended collecting this data. **Doug** would like protocol reviews or simple one-page summaries of project's comments on the revised protocol by **February 14, 2008**.

Additional comments captured included:
C. Watry: Use of power analysis to determine appropriate efficiency rating.

The portion of the protocol relating to performing weekly live box calibration to determine the effects of predation or live box integrity compromise and subsequent adjustments to catch and summarized data was discussed briefly. Most people believed the losses were likely negligible or not unlike conditions found in the wild. Data is sometimes eliminated from summarization and analysis when suspect, as may occur when hatchery smolts are released when fry are present. Physical structures deployed within the live boxes are another method used to allow refuge for smaller fish when multiple size class or larger predators are present.

A final suggestion/comment by **J. Williams** was to take a look in the old CDFG Fishery Bulletins (e.g., Sardine Fishery information) as the information is very intricate and most importantly honest.

VI. Conclusion and Next Meeting Date and Topic.

The next meeting is tentatively scheduled for April 24, 2008 at the Yolo Bypass Wildlife Area. The topic will be a second discussion on the CAMP protocol, based on a synthesis of the information provided to Doug Threloff from this meeting and written comments submitted to him in the coming weeks. Thanks to all for a lively, inter-active discussion.