

UPPER SACRAMENTO RIVER MONITORING PROJECT WORK TEAM

March 9, 2006

Meeting was held at the Red Bluff Fish and Wildlife Office, 10950 Tyler Road, Red Bluff, CA 96080

List of Attendees:

Andrew Fecko, DWR, Sacramento
Laurie Hatton, DWR, Sacramento
Terri Wegener, DWR, Sacramento
Jim Weiking, DWR, Sacramento
Bruce Ross, DWR, Red Bluff
Aric Lester, DWR, Red Bluff
Stacy Cepello, DWR, Red Bluff
Jason Kindolph, DWR, Oroville

Jerry Sears, Tehama-Colusa Canal Authority, Red Bluff

Robert Vincik, DFG, Sacramento
Joe Johnson DFG, Sacramento
Marina Brand, DFG, Sacramento
George Edwards, DFG, Sacramento
Alice Low, DFG, Sacramento
Monty Currier, DFG, Redding
Colleen Harvey-Arrison, DFG, Red Bluff
Mike Berry, DFG, Red Bluff
David Grant, DFG, Red Bluff
Amy Lyons, DFG, Red Bluff
Mike Brown, DFG, Sacramento
Doug Killam, DFG, Red Bluff
Tracy McReynolds, DFG, Chico
Randy Benthin, DFG, Redding

Tara Morgan, River Partners, Chico
Dan Efseaff, River Partners, Chico

Ryan Luster, The Nature Conservancy, Chico
Greg Golet, The Nature Conservancy, Chico
Frank Ligon, Stillwater Sciences, Arcata

Bruce Oppenheim, NOAA Fisheries, Sacramento

Tim Hamaker, CH2MHILL, Redding

Ernie Ohlin, Tehama County, Red Bluff

Susan Strawn, Chico State University

John Hannon, BOR, Sacramento
Buford Holt, BOR, Shasta Lake
Paul Freeman, BOR, Red Bluff
Richard Corwin, BOR, Red Bluff

Rick Wilder, FWS, Stockton
Tom Kisanuki, FWS, Red Bluff
Jess Newton, FWS, Red Bluff
Kevin Niemela, FWS, Red Bluff
Matt Brown, FWS, Red Bluff
Felipe Carrillo, FWS, Red Bluff
Brenda Olson, FWS, Red Bluff
Kellie Whitton, FWS, Red Bluff
Tricia Parker, FWS, Red Bluff
Bill Poytress, FWS, Red Bluff

Welcome by Jim Smith, FWS, Project Leader

Lead in by Aric Lester, DWR

Program/Project Updates

Kevin Niemela – Acoustic tagged steelhead kelts from the Coleman National Fish Hatchery Complex were released on April 5, 2005. These fish have been tracked since their release using a series of hydrophones located in the Sacramento River, delta, and bay. Several tagged fish have been tracked to Rio Vista and some were detected under the Golden Gate Bridge. We are currently tracking upstream migration as well. At least 3 have made it back to CNFHC. A similar study will be conducted this year, with approximately 40 kelts to be tagged and released in early April. All steelhead kelts to be released from Coleman NFH in 2006 will be floy tagged and VIE tagged with a chartreuse injection tag near right eye.

Winter carcass survey study this summer; from May thru August in upper Sac River.

“Heads up” on an upcoming acoustical tagging study to be conducted jointly by UC Davis and NOAA Fisheries. As part of this project two hundred late-falls Chinook and two hundred steelhead smolts from the Coleman NFH will be tagged and released in early 2007. Fall Chinook video-monitoring in Battle Creek will be cooperatively conducted with DFG (with Doug Killam, et al.).

Mike Berry – 3 larger restoration projects in Clear Cr. Project plans have been completed, moving creek into a new channel, fill in clay area, replanting, building spawning areas. Waiting for funds to (ERP) get contracts completed. Battle Cr. – 5 dam removal has run into snags; process is still proceeding,. Coleman Hatchery’s Barrier Weir - plans are complete and the project should start this summer. Barrier Weir should be more fish tight, and improve ability of fish to move through the ladder.

Matt Brown – Clear Creek and Battle Creek activities as usual- Snorkel survey in summer and fall and kayak surveys in winter, and RST operations. IFIM in Clear Cr. that will take another year to complete, in conjunction with the FWS Sacramento office. This August, a picket “A-frame” weir will be installed to separate fall & spring runs in Clear Cr. Will be using Bismarck brown for identification purposes.

Jess Newton - fyke net in the Coleman National Fish Hatchery’s intake canal was recently pulled, due to funding limitations. The purpose of the fyke trap was to estimate numbers of fish being entrained by Hatchery Intake #2. In Battle Creek, about 30 sites in the watershed are being monitored for water temps. A new barrier weir will be reconstructed beginning in 2006. FWS does the fish passage at the current weir, just began operations for this year on March 1. This year, we are switching over to digital monitoring. Digital video has motion detecting capabilities that we do not currently have with analog equipment. Should be a cost-saving device. When

water is highly turbid, we are using a back-up Vaki device which is infrared. Thus, they have analog, digital, and infrared Vaki capabilities at the weir.

Aric Lester –North-of-the-Delta Offstream Storage (“NODOS”); contemplating monitoring study needs, and Aric will present later today on this subject.

Bill Poytress – the mainstem Sacramento River juvenile salmonid monitoring operations are currently funded through June of this year. Bill is working with the DFG to receive funding for this project through the Directed Action funding process.

George Edwards - Continuing to collect of fish from Deer Creek, Sacramento River, and lower Yuba River for otolith analysis (Distribution and Relationship of Resident and Anadromous Central Valley Rainbow Trout). Program was extended for two more years to July 2007 because of the difficulty in collecting sufficient number of samples in 2003 - 2005 time period. In addition, we are taking rainbow trout tissue samples from the lower Feather River, lower and upper Yuba River for genetic analysis (Central Valley Steelhead Genetic and Population Structure Evaluation). Carlos Garza, NOAA Southwest Fisheries Science Center's Santa Cruz laboratory is performing the genetic analyses of these samples and comparing the samples to hatchery stocks, rainbow trout tissue samples collected from other Central Valley streams and Coastal steelhead stocks. Only way to differentiate a resident rainbow trout from a steelhead, in freshwater, is by analyzing the strontium to calcium levels in the otoliths to determine if fish is anadromous or of anadromous origins. This work is being done by Chris Zimmerman at the USGS Anchorage Alaska Science Center.

Colleen Harvey-Arrison – RSTing in Mill and Deer Creeks is now permanently funded by the IEP and will continue to sample October thru May to provide water managers with outmigrant timing of Chinook and Steelhead. This year fall –run escapement surveys, looked at BC, CC, Mill Cr., and Deer Cr. For adult spring run surveys, continuing to do snorkeling surveys for distribution and population counts in Deer and Antelope Creeks. Redd surveys are made in Deer, Antelope and Mill Creeks for spawning distribution. In Mill Creek, redd counts are expanded into population estimates. In Antelope Creek spawning surveys results show that up to 50% of the holding spring-run Chinook population may not have survived to spawn. Additional water temperature monitoring is being done to compare holding and spawning temperatures between these three watersheds and determine whether water temperature may be a limiting factor in Antelope creek. Have been funded to do a fish passage study in lower Mill Cr. to determine flow conditions to get fish past the lowermost diversion in Mill Cr. Advocacy was from private landowners and local irrigation company concerned over ability of spring Chinook to migrate upstream.

Alice Low – Received funding for three Central Valley-wide programs: development of steelhead and Chinook escapement monitoring plans, Chinook age determination program, and constant fractional marking program. All three programs are now in the contracting phase; final contracts should be in place in the next few months. For the constant fractional marking program, the equipment manufacturer (Northwest marine Technology) will be ordering parts soon to begin construction of the Central Valley Marking Trailers. Tagging will begin in the spring of 2007. All production releases of fall-run Chinook from CV hatcheries will be marked/tagged at a 25% rate. At CNFHC, USFWS will borrow a tagging trailer, and conduct a trial program to tag the late fall-run with automated tagging equipment this fall. Under the CALFED contract, 4 automated tagging trailers will be purchased for the CV tagging. CALFED will also fund the tagging work for a two-year period, 2007 and 2008. Funding will be needed to continue the tagging in future years. Automated tagging trailers currently cost \$1.1 million each.

Ryan Luster - The Nature Conservancy is concentrating on foothill tributary watersheds to the Sacramento River and conserving and restoring floodplain habitats of the Sacramento River. They have helped secure funds to Sacramento National Wildlife Refuge Complex, and restoring various other areas along the river. Most funding has come from CALFED. They are also doing

a sub-reach planning project between Princeton and Colusa; 20 K acres have been secured in conservation ownership in this area, over 3,500 acres have been restored along the Sacramento River. Also securing properties near Sacramento River Bidwell State Park. Working on Hamilton City set-back levee. Will be removing the existing levee and installing a ACOE levee. New levee construct scheduled in 2008 or 2009, depending on /congressional allocation. Lassen foothills project – secured 60K acres in conservation easements. Primary along Mill , Deer, Antelope, and Battle Creek. Will hold these easements until a future date until a land trust is established. Recently purchased a water right in Mill Cr., trying to figure out how to return the water for benefitting fish. A private water right was purchased.

Dan Efseaff - River Partners has benefited from using a targeted species approach in restoration designs. In other words we try to incorporate habitat features that benefit specific wildlife species. For example, least Bell's vireo has shown up on a restoration with features built into the design for it. Our focus has been for terrestrial animals but we would like to develop more things for aquatic species. Some projects have flood management components built into them. La BARRANCA restoration with FWS. Feasibility aspects of the work was looked at with FWS Red Bluff Fisheries staff. Avoiding fish entrapment was built into the study. The Llano Seco feasibility study looking at options for managing FWS property on river left and river right. Concerns over river meandering in this area; some options are allowing river to punch through the bend. Would like to work with fish researchers to determine features that would benefit fish. Other projects of interest include work on Battle Creek (restoration on DFG land and a plan at Gover Ranch.

Jason Kindolph - working on the Feather River. Continuing normal work , RST, redd surveys, re-licensing project. Settlement to be signed later this month. Alaskan style resistance weir to look at spring run Chinook. Weir program will also provide information on steelhead and fall Chinook. Using similar methods described by Jess Newton. Newer tags have Jason's phone #; while older tags have his name and phone number on it.

Some of the fish have shown up in the Yuba, returned by anglers. This year, reward tags will be applied to get a handle on harvest levels. Operating a creek survey in the Feather River. Marking 100% of spring Chinook that leave Feather River; this is the 4th year of marking; year 5 may be the last.

Habitat expansion program for spring-run in the valley. Working with PGE on other areas other than Feather River. Some spring run will be acoustically tagged, If you see a cord in their mouths, it will be an acoustic tag. Switching to Vemco acoustic tags; want to do something similar to what FWS is doing with SH at Coleman.

Randy Benthin – commented that they've had to play "tag detective" due to insufficient information on tags that public has brought in.

Jason Kindolph – indicated that minimally, the agency name and phone number are on their tags.

[*Tricia Parker* – post meeting comment from: AFRP is funding a geological analysis of the stability of Big Chico Creek in the Iron Canyon Area. HDR Engineering is now doing the initial stages of this work]

Tracy McReynolds – awaiting funding that would carry program for 3 additional years, to finalize Butte Creek project. FERC relicensing. At Big Chico Cr., will continue adult escapement work.

Rick Wilder – Conduct juvenile salmonid monitoring in Delta ,Sacramento River, San Joaquin River, and San Pablo and upper San Francisco Bays using seines, mid-water trawl, and Kodiak trawl. Numbers appear to be a little lower than 2004, but review of data is not complete. All data are available on a near real-time basis on the BDAT website. Our office is not actively involved with current POD (Pelagic Organism Decline) studies in the Delta, but we anticipate that our data will be used in the future and that we may add sampling as part of this effort. In the last year, we

started a new sampling technique that looks at the condition of the fish we measure at all of our sites. This technique is called PDELTA, and stands for the attributes we sample (Parasites, Deformities, fin Erosion, Lesions, Tumors). We have also finished up sampling at Liberty Island (at the lower end of the Yolo Bypass) and are currently awaiting word from CALFED on funding to continue monitoring there.

Ernie Ohlin - they partnered with Butte County to look at recharge areas of Tuscan; monitoring test wells, to understand ground water usage patterns throughout the county. Tehama County is engaged in what is happening with the Sacramento River floodplain and in keeping in touch with impacts to landowners. Noted that delivery of groundwater off-parcel requires a permit from the county and is not regulated otherwise.

Randy Benthin – (missed his statement)

Susan Strachan - Big Chico Cr. Geologic study underway to repair fish ladder through "Iron Canyon" to restore spring run migration to holding and spawning habitat. Recharge study cited by Ernie Ohlin (see below) also will address stream/aquifer interactions that could provide needed information to manage impacts to spring run salmon streams from increased groundwater extraction from the Lower Tuscan aquifer. This aquifer surfaces in the watersheds of Butte, Big Chico, Deer and Mill Creeks and is theorized to be hydrologically connected.

Greg Golet - TNC is working with partners on the development and implementation of a Monitoring and Assessment program. Program is focusing on the middle Sacramento River, primarily between Red Bluff and Colusa. Focus is the river and floodplain and associated biota. Developing the program through CALFED ERP funding. Program intends to develop a system to track changes in ecosystem health and measure the effectiveness of previously implemented restoration projects. TNC is working with UCD, UCSC, Chico State, River Partners. Funding is not yet awarded (but is close). The 2-yr project will combine remote sensing with field studies, will make new detailed aerial photos, mapping efforts available to the public. Main work focuses on characterizing floodplain (vegetation) and channel attributes and evaluating status of songbirds, the Valley Elderberry beetle. No fisheries experts on the project team, so there will be a need to coordinate with fisheries experts such as those on the upper Sacramento PWT to ensure that appropriate indicators (metrics) are incorporated into assessment framework (a TNC scorecard) Will also need to coordinate with fisheries experts on the development of the monitoring plan so it can well represent aquatic species (especially salmonids).

Doug Killam – "we count fish"; annual reports are available which summarizes their work.

Bruce Ross - DWR Northern District assisted BOR Denver with sampling bed sediments in the major tributaries entering the Sacramento River between Redding and Colusa. Currently working on report that describes the erosion potential of the Upper Sacramento River based on bank composition, slope, height, morphology and vegetation. Minimum mapping unit is about 200 feet.

Richard Corwin – Contractors are finishing up the installation of the new internal helical (centrifugal) pump at the Red Bluff Research Pumping Plant (RBRPP). This will be the second internal helical pump installed at the RBRPP. Along with the two Archimedes lifts already in place, the maximum volume of water diverted into the Tehama-Colusa Canal from the Sacramento River would be approximately 320 ft³/sec.

A total of 24 pump-passage trials will be conducted with the new internal helical pump starting in June of 2006. Approximately 5000 hatchery late-fall Chinook salmon from the Coleman National Fish Hatchery will be used in the study. We will try to get two size ranges, less than 45 mm fork-length and 45-70 mm fork-length sizes. Copies of the study plan and a final report will be available upon request. Contact Richard Corwin at rcorwin@mp.usbr.gov.

Tricia Parker – Bear Creek (Shasta County); small numbers of SH & Chinook are present in this system. The one-day citizen monitoring results surveys are available on their website (<http://www.bearcreekwatershed.com/nodes/aboutwatershed/reports/documents/BCWGreddsurvey2005.pdf>) ROD for Battle Creek is pending signature.

Brenda Olson – On Mill creek, pilot study to monitor spring run Chinook. Video-monitoring site planned for Cow Creek.

Buford Holt - Interested in green sturgeon and spring Chinook investigations in the upper Sacramento River, in relation to Red Bluff Diversion Dam, interested in why spring run haven't rebounded in the upper Sacramento River. Some funding is available to conduct work.

John Hannon - Reclamation is requesting re-initiation of the October 22, 2004 CVP/SWP OCAP biological opinion to include the effects of ongoing water operations on the newly designated critical habitat for steelhead and spring run Chinook and conferencing on green sturgeon in case they become listed. NMFS is providing informational needs for the consultation.

Jim Smith – mentioned his recent attendance at a gravel monitoring meeting. Annotated bibliography was provided to the meeting group. GIS map atlas of gravel monitoring sites from Clear Creek confluence with the Sacramento River to Keswick Dam. Jim DeStaso has it on his CD. Jim DeStaso unable to attend this meeting, so Jim S. provided the update.

BREAK

Aric Lester's presentation on NODOS.

Purpose of presentation was to describe NODOS in general and its implications for monitoring, and to improve coordination with those that conduct and manage monitoring and studies in the Upper Sac.

Four off-stream reservoir sites were considered under North-of-the-Delta Off Stream storage and Sites Reservoir was determined to be the most feasible from an engineering and environmental perspective.

Pumping plant near river mile 158 – bottom of meander reach. Its also in the middle of the "black hole". Sitting on the underlying geological control, i.e. its stable. Conveyance of water from TCC and GCID pumps are also being considered as options for Sites Reservoir. The increases in diversion capacity at TCC and GCID are being considered along with their current capacities. The maximum capacity being considered is 5000 cfs. The capacity of the new pump at river mile 158 would be from 1500 to 5000 cfs.

NODOS would give flexibility to manage water. With Sites Reservoir, there would be greater opportunity to manage water through storage, diversions, and flow. As an example, storage in Sites Reservoir could be used for municipal and irrigation supply instead of water in other Central Valley Reservoirs. That same volume of water could be used in other central valley reservoirs for cold-water pool or to provide environmentally beneficial flows. Also, diversions could be made outside of the irrigation season and curtailed during the typical spring-fall irrigation season because parts of the local irrigation supply could be delivered from Sites Reservoir. Flows could also be managed by making releases from Keswick to provide environmental benefits in the meander reach and then those releases could be captured at the new pump at river mile 158.

EIS/EIR and BA is being worked on, but only those parts that do not deal with operations. Flow Regime TAG will be convening again, but will be lead by DFG. TAG has two roles – 1) provide input into NODOS planning process and 2) describe comprehensive flow needs for Sac River; BOR is doing federal planning studies to examine federal interests. DWR is identifying public & environmental benefits.

-What are the implications for monitoring in the upper Sac River? - CALFED project, thus should be evaluated with the best scientific information; CALFED project will be implemented with net beneficial effect to species and habitat and be consistent with state and federal recovery plans. It is these two items (scientific process and net benefit) that form the bases for NODOS importance to monitoring in the Upper Sac and this group should have a vested interest in seeing these two items happen as part of the NODOS program.

-Presented slide that generally outlined steps for evaluating actions thru scientific process that is identified in CALFED documents. Suggested that within this process it is around key uncertainties that the NODOS program has a common interest with monitoring programs and studies on the Upper Sac and it is where finding common ground is most meaningful.

-Presented slide on coordination around key uncertainties – proposed that we begin by identifying key uncertainties that we have in common and outlined some benefits of coordination (i.e. serve goals of others, cost effective, will begin to collaborate to improve integrity of results and analysis).

-Presented some key uncertainties related to the evaluation of beneficial and negative fishery impacts, ranging from the relative abundance, size, and timing of juveniles at river mile 158 to the changes in flow regime that could be made to improve fish populations. An example of coordination through common uncertainties is an effort by DFG and DWR to put forth a proposal to sample fish at river mile 158, using screw traps to address uncertainties related to relative abundance, size and timing of juvenile salmonids at this location

Robert Vincik, DFG – Presentation on Knights Landing Rotary Screw Trap Monitoring. The study began in 1995; lowest sampling site on the sac. River, but before influences of Yuba, Feather, and American rivers. 2 8-ft traps fished in tandem. Severe debris loads necessitated a simple solution of rotating the traps to allow debris to dislodge downstream. Parameters examined – flow, temp, catch, secchi depth, run composition,

“Closing the gap” – 120 miles between RST operations. Proposed sites at (upstream of) Moulton Weir, and at Grimes. Traps have been in the same site the past 4 years. Current thalweg site appears to be the best site. Efficiencies have been about 1%. They release bismarck brown stained fish one mile above the traps.

Have been successful in maximizing the number of days they have fished.

Tracy McReynolds – has conducted RST in Sutter Bypass during high flow events and have captured Coleman National Fish Hatchery fish.

Robert V. – has not been able to correlate any catch drops when the bypasses open.

Winter run fish take about 2 months from the time they appear at GCID to when they arrive at Knights Landing.

Mike Berry – asked if anyone has examined cumulative impacts of salmonids as they encounter multiple traps during their downstream migration. The impacts from one trap might be insignificant, but how many traps must the fish encounter to constitute a significant impact?

Bruce Oppenheim – trying to put together a spreadsheet of cumulative sampling impacts, but not fully developed. Problem is huge discrepancy between estimated take and what actually occurs. NOAA has not tracked it. Usually, mortality appears to be low.

Ryan Luster – The Nature Conservancy. Sacramento River Ecological Flows Study, a multi-entity study. They examined role of Keswick Dam in truncating spring high outflows; 10 year data displayed.

At the Keswick area, pre-CVP flows had higher spring flows and low summer flows. Post CVP project resulted in truncated spring flows and increased summer/fall flows. Current flows have increased the post-CVP flow pattern in summer/fall.

Primary study objective is to synthesize existing interdisciplinary information which might address pre-existing scientific uncertainty of the NODOS project and other future water management and planning projects; propose strategies to achieve multiple species benefits and meet human water needs.

Deliverables: ecological tradeoffs analysis, develop new and evaluate new flow-related strategies to address uncertainties (sediment model, tradeoffs analysis), etc

Focal species – Chin, SH, green sturgeon, western pond turtle, bank swallow, Fremont cottonwood. Sac ETA overall design: flow management; gravel additions; levee setback are the management actions, to which various submodels address physical, and focal species. The Performance measures for this design address the Habitat and Biological components for fish and wildlife species.

Frank Ligon – State of the system report highlight – more gravel is needed below Keswick Dam. Hypothesis – reduction of winter run Chinook was due to reduction in spawning gravel. Are the recent increases in winter run production due to increases in spawning habitat? Frank displayed a chart of the 1964 gravel survey versus a 1980's study and showed that there was far more gravel available in 1964.

Field studies – looking at redd scour, pebble counts to determine progressive gravel coarsening. Helicopter videography to record redd locations to support spawning habitat mapping. Off channel habitat study and bank study (being done by Matt Kondolf, UC Berkeley). Meander migration modeling.

Previously above GCID, spawning was occurring only on the margins, but now spawning is bank to bank.

Tara Morgan, River Partners. Presentation on “Cottonwood and Salmonids Happily Ever After”. Study looked at current cottonwood recruitment as it relates to the altered hydrology of the Sacramento River. Cottonwood and salmonid species historically co-existed under a natural hydrograph, but today both have significant population reductions. Cottonwood recruitment hydrological requirement could possibly provide an indication towards the seasonal hydrological requirements for salmon.

Significant hydrologic changes have altered physical & biological characteristics of the Sacramento River riparian habits. Only 5% of the riparian forests remain along the river. Cottonwoods coincide with river meandering, seed establishment occurs in relation to flow. Cottonwoods are a primary successional species. 1 in 5 and 1 in 10 year frequencies of flood events are needed for successful cottonwood recruitment. 183 and 192.5 river mile study sites, on meander point-bars along the middle Sacramento River.

The four year study was conducted primarily during the 2002-2005 growing seasons. It looked at river/alluvial groundwater dynamics, seedling survival, and cottonwood water use. Two point bars had multiple sampling transects perpendicular to flow, stage recorders, and shallow groundwater monitoring wells with pressure transducers.

Cottonwood water use data collection included water extracted from cottonwood xylem tissue (seedlings, juveniles, and mature trees), precipitation water, stream water, groundwater, and soil water. Xylem water was compared to all environmental water on site.

Results differed each year in terms of causes of seedling mortality, but successful seedling recruitment did not occur during the four year study time frame. Once cottonwood seedlings germinated during spring flows, they were killed by inundation or desiccation due to the way flows are managed on the Sacramento River for storage and irrigation. Low flows during the spring cause inundation later in the season (from substantial increases during summer irrigation), rapid declines during the spring and/or late fall cause desiccation. Seedling germination occurs right at the waters edge, so only slight changes in flows result in near total mortality. Small daily incremental changes in flow are significant in terms of cottonwood survival.

Monitored groundwater and river stage and determined that study sites were within a gaining reach of the river. Because depth to groundwater is linked to river stage, desiccation would occur with the rapid decline of river stage. The decline of groundwater levels should not outpace the rate of seedling root growth. For those seedlings that make it through the growing season into the fall, steep declines in river stage during fall can be detrimental to seedling survival. Nearly 100% seedling mortality during the fall was observed in all four years of the study.

Using a phenological approach, the study determined that seed release can be predicted using ambient air temperature, therefore the timing of spring high flows could be managed to maximize benefits for cottonwood seedling establishment.

Examined isotopes in xylem tissue to determine origin of water. Confirmed that cottonwoods are obligate phreatophytes and are dependent on the availability of water from the water table. There was evidence that cottonwoods also use a portion of deep unsaturated soil moisture (above the water table) that was replenished from river flooding during high water demand (summer).

TKK resumed notes at 1315 hrs

Bruce Oppenheim – Previous biological opinions for operation of CVPIA and DWR's and USBR's delta pumps have been for operations over short periods – 1 to 3 years. OCAP Biological Opinion is the first to consider operations over a 25 year period. Bruce provided an overview of the circumstances leading up to OCAP.

OIG report was in response to a congressional inquiry. OIG findings – consultation proceeded without sufficient information. Regional review was not completed. General counsel did not sign off. No evidence of a draft "jeopardy opinion provided to BOR.

OIG recommended: review science & information used in the Biological Opinion. CALFED Science Panel Review - NMFS requested evaluation of whether "best available science" was used. Evaluate technical tools – models, analyses, uncertainties, results, assumptions, etc.; independent experts from OR, CA, WA.

Panel concluded that the information was not the best available. There were 3 over-arching issues; 15 technical issues. (e.g.) 1) - no conceptual model; 2) analytical framework; 3) life cycle approach.

(The BO was a 300 page document, had to prioritize what went into the document. Focused on aspects that led to mortalities)

Panel Major findings – global climate change was not considered,. Variability in ocean production was not incorporated. Uncertainty not addressed. Some models appeared flawed. Genetic and spatial diversity was not given enough consideration.

Technical issues – 1) too coarse of a temporal resolution in the analytical temperature modeling; 4) reliance on questionable temp-egg mortality model (LSalmon-2) Issue 8) effects on life history traits growth rates, fecundity) and population structure; 9) effects of smolt migratory behavior and predatory fish on juvenile survival; 12) negative effects of hatcheries.

Various data gaps identified by the CALFED panel review. – felt number of models needed to be addressed (e.g. disease, wild-hatchery interactions, predators, linking models across life stages, effect of reduced gravel and large woody debris, fish routing, growth fish stressors and survival.

Center for Independent Experts Review (NOAA's Maryland office).

Two of three reviews completed by Univ. of Miami, and Montana State Univ. MSU gave favorable opinion, but recommended additional studies: thermal refugia; flushing flows, indirect effects, contribution of delta entrainments, historical temperature conditions, juvenile density/habitat-type relationships.

Univ. of Miami review was not favorable – recommended comprehensive ecosystem modeling exercise and adaptive management. Agreed with CALFED findings.

NMFS response: 10 formed a committee of salmon experts, evaluate a 2 peer review reports; within 3 months report to the Science Program Director. Should come out about May 5, 06.

Bruce's conclusions: pursue studies at ACID, predation studies below RBDD, water quality from agricultural returns, UCD sturgeon passage at RBDD, Use DCC (direct cross channel) studies to evaluate NODOS site selection. We need to be careful of where the intake screens will be located.

Bill Poytress – Presentation on Temporal Patterns of Chinook Distribution, and Length at Date Criteria. FWS' juvenile monitoring operations at Red Bluff Diversion Dam (RBDD) use the Sheila Greene length at date criteria to assign a juvenile fish to its respective "run" designation.

Frank Fisher's growth model work was derived from fall Chinook production from the TCCF artificial channels. Growth curve was fitted to fork length at age (days); and derived a curvilinear relationship, for fish up to 90mm. It was later expanded to larger fish through process of extrapolation. Fish captured at RBDD is typically less than 90 mm. Same model used for the 4 runs. Fisher developed growth curves. Limitations of the model due to fish raised in an artificial environment. Assumes same growth rates for all runs of salmon – does not account for differing life strategies. Extrapolation for larger fish.

The model could be modified to incorporate variability of fish from different systems and runs.

Bill presented temporal distribution of salmonids captured at the RBDD RST program. Bill concluded by stating that the length at date is a "good tool". Winter Chinook data is likely the most accurate data. Spring Chinook distribution may be heavily influenced by fall Chinook (temporal overlap). Late-fall passage appears to be bi-modal, based on consistent patterns observed in eight seasons of sampling.

Mike Brown, – Presentation on their new Central Valley Creek Survey, led by Rob Titus. Funded by 75% FSFRA, and 25% from state match from the Bay Delta enhancement stamp. They are currently staffing up, and gearing up with boats/equipment. Study will focus on Sacramento River and delta. Point surveys emphasis, tailored to sport species – sturgeon, Chinook steelhead, shad, and striped bass. Not determined whether roving and or point-surveys will be done Collect data on all species encountered.

Emerging issues – rainbow steelhead life history strategies – scale and otolith analyses. Hooking mortality in juvenile steelhead; sturgeon.

BREAK Resume at 1430 hrs.

Group Discussion

Bruce O. – NOAA identified projects; the assembled committee will address what actions to do next, what is feasible, and what can be done at the consultation level. It may change the way they do things, and how they assess the effects of large projects. There are some good things that came out of the review process. Lot of what they do is tied up in the legal review process, thus adds time.

Tim H - How will these reviews affect the BO – will it be amended?

Bruce O. – No, BO will not be changed. By the end of the summer, decisions may be made whether the OCAP consultation will be reinitiated, which could result in a new B.O.

Matt B. - Appears that the data gaps identified under review of the OCAP BO overlap with the needs of the NODOS investigation and the Nature Conservancy effort. Focus future monitoring effort to answer data gaps common to two or more projects

Aric L. – Agree with Matt. Asked Bruce if there was an avenue/process to coordinate our efforts to bridge data gaps that we have in common.

Bruce O – CALFED is probably that avenue/process via PSP. CALFED is losing their lead scientist, and is on retainer; not there for day-to-day operations. Ron Ott is a contact, involved in Franks Tract, and other delta projects – He is second in command. Bruce recommends going to their workshops.

(Missed who said this Bruce or Alice Low?) - Future CALFED PSP will be more focused.

Matt B. - asked if there is a committee that would be appropriate to work on the developing monitoring questions and proposals common to all of the projects?

Jim Wieking - NODOS investigation sees a need to get TAG input in two areas, 1) NODOS related to flow regime issues, and 2) there seems to be recognition among TAG members that a more comprehensive Sacramento River regional implementation plan, (similar to the CALFED Delta Regional Ecosystem Restoration Implementation Plan), is necessary. DFG has been funded to initiate a more comprehensive effort with the TAG. Was hoping that the flow-regime TAG would be able to provide initial direction moving toward a RERIP.

Matt B. – would DFG determine the scope of the group and who is in it?

Stacy C. – Currently in Dave Zezulack's shop.

Jim S. – another area where NODOS needs to interact is the Shasta Enlargement Project. Does not appear to be interaction between these projects.

Jim W. - DWR, DFG, and the TAG will help scope the new effort. DWR and Reclamation staff are discussing Reclamation's involvement in the TAG.

Tim H. – is BOR updating the LSalmon model?

Jim S.– Cottonwood mortalities – we've been hearing about it for some time but now we have empirical information. Is this information getting fed into operations?

Stacy C. - No. There are a number of good models throughout the west that have incorporated cottonwood data. Its just not very high on the central valley radar.

Bruce O. – could be worked into the 800,000 acre feet of B2 water.

Mike B - the fall drawdown dewateres redds, and this (cottonwood) subject would tie directly into it. By going down below 4,000 cfs, redds are dewatered near Turtle Bay.

[Post-meeting clarification by Matt Brown - The fall drawdown impacting cottonwoods occurs in August and September. The redd dewatering occurs in October through December.]

Bruce O. – they take a conservative approach earlier in the water year, and thus they cut the flows. There are 3 fish agencies on the committee that makes the B2 flow decisions. Nick Heiman, FWS is on the committee. Trying to minimize the yo-yo effect to avoid dewatering the redds.

Jim S. – its complicated because regulation up here causes problems on the American River – the Sacramento River is a big water system.

Bruce O - the rice decomposition flows are problematic for fish needs.

Jim S. – control point will be moved from Jellys Ferry to Falls Ferry, which allows BOR to cut back flows to maintain flows.

Matt B. - even if B2 can't keep the river flows up, Sites is supposed to keep more water in the river during the difficult periods of lower flow.

Aric L. – benefits need to be quantified, as to (e.g. how many redds, how many cottonwoods, etc). These are the type of uncertainties we need to get at.

Bruce O. - has the NODOS project been assessed enough to know when and how much water is coming back into the river?

Aric L. – No, we need to know what the temperature of the water is when and where it goes in; this has not been fully investigated. Water will be taken every year to help fill it up.

Jim W. – according to initial simulations, NODOS will not negatively affect the storage in Shasta Lake. In fact, NODOS tends to improve Shasta carry-over storage in many years. Every year there is a quantity that is identified to be delivered, (e.g.) to TCC.

Jim S. – Shasta enlargement would decrease the frequency of high flows in the river.

Jim W. – high flow diversion may not be an option, due to high sediment loads during high flows. If State funds were available, how would you change the flow regime to most effectively restore the Sacramento River?

Group discussed the different groups existing for exchange of information, group seemed to acknowledge that the “fish-centric” people are well connected.

Matt B. – brought up that Bruce O. advocated predation studies below RBDD, Aric recommended predation studies in relation to NODOS, and that Mike Brown's presentation identified that predation will be looked at for their new creel census project. Matt asked Mike if the creel studies will be limited to salmonids. Mike clarified that they will look at all sport fish species. Their last creel census iteration included black bass.

Aric L. - raised subject of conceptual models. Not sure where we were going on this subject, as a group consciousness. Used conceptual model as part of Yuba River Modeling Forum (forum to improve coordination among modeling efforts on Yuba...now defunct) as bases of a framework that identified where efforts overlapped.

Jim W. – NODOS has included a preliminary set of conceptual models in its soon to be released administrative draft flow regime report.

(Group touched upon the subject of a new PSP. Some group members had heard about a possible Science PSP surfacing. Alice Low thought the new PSP would be more specific as the subject areas to be requested.)

Marina B. - heard that the Ecosystem Restoration Program will go towards the Directed Action, and away from the more broad PSP.

Tricia P. – AFRP fund pool has been reduced, but their processes are dynamic. Work plan was previously on the AFRP website, but is definitely on the BOR CVP site.

Alice L. - asked about the status of the NODOS project – is it a real project? (was a response given??)

Jim W. – difficulty in the past has been to get the local water districts to tell DWR what they want, what is needed. Locals asked “what does the State want, and what does the Feds want to do?” Trying to develop a restoration package for the project first. [Note: current schedule is for a draft EIS/EIR by spring 2008 and Final in Fall 2008.]

CONCLUSION

(The group agreed to meet next year, on Thursday, March 8, 2007. The location will be the Conference Room, U.S. Fish and Wildlife Service, Red Bluff. The coordinating agency will also be the U.S. Fish and Wildlife Service; the POC will be Tom Kisanuki (530-527-3043). The Agency “on-deck” for 2008 will be the Bureau of Reclamation.)

Many thanks to **Aric Lester** for a fine job of coordinating this year’s meeting!