Annual Upper Sacramento River Monitoring Project Work Team Meeting Notes

April 28, 2011

USFWS Conference Room

Participants:

First	*Last*	*Affiliation*
Randy	Baxter	USFWS
Mike	Brown	DFG
David	Colby	USFWS
Erin	Collins	DFG
Peter	Coombe	DWR
Richard	Corwin	USBR
Diane	Coulon	DFG
Gary	Diridoni	BLM
Jane	Dolan	SRCAF
Jim	Earley	USFWS
Ryan	Foote	USFS
Paul	Frank	New Fields
Colleen	Harvey Arrison	DFG
Alex	Hearn	UC Davis
Jack	Ingram	USFWS
Rob	Irwin	SRCAF
Matt	Johnson	PSMFC
Doug	Killam	DFG

First	*Last*	*Affiliation*
Tom	Kisanuki	USBR
Aric	Lester	DWR
James	Lyons	DFG
Amy	Lyons	DWR
Chris	Mayes	USFWS
Dale	Morrison	PSMFC
Bob	Null	USFWS
Darin	Olsen	PSMFC
Bruce	Oppenheim	NMFS
Tricia	Parker Hamelberg	USFWS
Bill	Poytress	USFWS
Colin	Purdy	DFG
Don	Reck	USBR
Joe	Silveira	USFWS
Jim	Smith	USFWS
Mike	Thomas	UC Davis
Robert	Vincik	DFG

Participant Updates:

1) Doug Killam (DFG) summarized escapement estimates for Sacramento River Chinook salmon. Annual reports are available on the CalFish website. Doug noted that trends have not been good over the past few years.
2) Gary Diridoni (BLM) reported that BLM has purchased 226 acres in the Bend Area that includes ¾ mile of river front. In the Bend Area, they continue to maintain ponds for recreational fishing.
3) Pete Coombe (DWR) is working with UCD to assess the abundance and distribution of adult green sturgeon in the Sacramento River between Hamilton City and Redding. This is the second year of data collection. UCD and DWR will also be measuring depth, velocity, and flow direction in known green sturgeon spawning and holding areas.
4) Colleen Harvey-Arrison (DFG) summarized Chinook salmon escapement estimates for Deer, Mill, and Antelope creeks. Adult fall-run escapement was very low last year. Colleen is not actively operating rotary screw traps on Mill and Deer creeks because of budget and contract issues. Annual reports are available from Colleen up through 2008.
5) Ryan Foote (Lassen National Forest) reported that they assess habitat on Deer, Mill, Antelope, Butte, and Battle creeks within the Forest. They have seen evidence of affects from wildfire

within the Deer Creek watershed. Surveys indicate that huge slugs of sediment follow fires, but recently data indicates that pre-fire conditions are beginning to return.

6) Bruce Oppenheim (NMFS) summarized incidental take and salvage at the Delta Pumps. An estimated 4,360 winter-run Chinook were lost at the pumps during the observation period. 6,000 is the take limit. Very few spring-run Chinook were probably entrained based on the number of Coleman late-fall salvaged. 404 steelhead smolts were salvaged. Bruce noted that there have been very few steelhead smolts in rotary screw trap catch and wondered if that is an indication of fewer out-migrants. Bruce is also interested in knowing the lower extent of green sturgeon spawning habitat.
7) Joe Silveira (USFWS) summarized USFWS's restoration and research activities at Sacramento River National Wildlife Refuge (NWR). The USFWS is authorized for the purchase of 18,000 acres and they are at 10,450 acres. They have not acquired any land within the last 5 yrs. The Nature Conservancy and USFWS will be restoring 280 acres of grassland, elderberry savanna/oak woodland, mixed riparian forest and cottonwood riparian forest on the Codora Unit. Vegetation will be planted in a way that will maintain flood flows and will protect the adjacent bridge and levee. TNC has also received funding from the California Wildlife Conservation Board to restore 145 acres of floodplain habitats at the Sacramento River NWR La Barranca Unit. Restoration activities such as orchard removal will begin in the fall after the last harvest. The USFWS is also working with River Partners and the Princeton-Cordora-Glenn and Provident Irrigation Districts (PCGID-PID) on project that includes 500 acres of floodplain restoration at the Llano Seco Riparian Sanctuary that will act as a non-structural flow split for the Sacramento River and Butte Basin. This project will also be designed to help sustain hydraulic conditions at the PCGID-PID Pumping Plant directly across the river at the northwestern end of the project. This involves both bank rock to maintain flows to the pump intakes and riprap removal upstream, which was installed for the flow split, but which is failing and non-functional. This project is in the environmental compliance phase.

   Researchers from Exeter University in the UK are dating landforms and slough deposits associated with Angel Slough at Llano Seco Rancho. Angel Slough is an intact remnant of the pre-meandering Sacramento River paleo-channel. Research will have implications for modeling climate change. Joe is working with the USDA–Cooperative Soil Survey (Chico Soil Survey Office) and DWR Northern Region Office (Geology) to characterize Bank Swallow Colony habitat (geology and soils) along the Sacramento River from Red Bluff to Princeton. Other investigations includes: riparian and floodplain vegetation mapping (DFG–Chico GIC/VegCamp); native bee pollinator research (UC Davis); large mammalian carnivores; Western Yellow-billed Cuckoo prey (CSU Chico); long-term riparian floodplain restoration monitoring (River Partners); cottonwood forest succession and oxbow development/succession (SUNY–TNC), and native grassland adaptive management monitoring (PRBO–TNC).
8) Tricia Parker Hamelberg (USFWS) is one of the leads for the Anadromous Fish Restoration Program (AFRP) out of the Red Bluff Office. She is interested in ongoing monitoring and research especially as it relates to the Anadromous Fish Restoration Program (AFRP). Rearing habitat for Chinook and steelhead, side channel restoration and creation, and redd dewatering are of

particular interest. AFRP is funding DFG to conduct a redd dewatering study on the Sacramento River (see presentation). Tricia is now a three-name person, but her email remains Tricia_Parker@fws.gov.

9) Bill Poytress (USFWS) summarized juvenile salmonid and green sturgeon monitoring he is involved in. CALFED funding for operation of the rotary screw traps and the Red Bluff Diversion Dam will be ending in June. Bill is seeking funds related to the OCAP BO to continue monitoring at this site. Over the last three years, Bill and his staff have conducted green sturgeon spawning habitat and larval migration surveys. Last year they identified 6 spawning sites within a 60k reach from Tehama Bridge upstream to Jelly's Ferry. This year they will be sampling at five sites in the reach near the GCID pumping plant. Bill's reports related to this work (2008-2010) are available on the USFWS Red Bluff office website.
10) Richard Corwin (USBR) summarized ongoing green sturgeon tagging and telemetry work he is carrying out. They have tagged 15 sturgeon so far. 14 of these fish passed the Red Bluff Diversion Dam and one did not. Fish either moved back downstream before gate closure, swam under the gates after gate closure, or remained upstream until fall or winter after the gates were out.
11) Alex Hearn (UCD) Summarized his USACE funded Bay-Delta research to track the movement of fish through the estuary. So far, his research has included steelhead and Chinook. This year they will be looking at green sturgeon. They would like to tag sub-adults. Alex's data on smolts from the Golden Gate to Benicia, indicates that smolts pass through this reach in a couple of days and do not reside there. Some move back and forth with the tide. Alex also provided a presentation of his work on the Sacramento River that examines fine scale movement of adult green sturgeon in holding areas (summary follows).
12) Mike Brown (DFG) leads the angler survey for the lower Sacramento River and Feather River. Mike provided a summary of results from last year's angler survey.
13) Mike Thomas (UCD) conducts green sturgeon telemetry studies on the Sacramento River. This year Mike is incorporating a new mobile survey into their survey to understand individual home ranges down to GCID. Mike also provided a presentation of behavior, habitat use, and site fidelity of adult green sturgeon (summary follows).
14) Jim Early (USFWS) summarized salmonids monitoring activities on Clear Creek and Battle Creek. Jim noted that the number of fall-run juveniles in Clear Creek was lower than expected and this may be due to fires and subsequent land management that have occurred in the upper watershed that led to the deposit of high levels of fine sediment in spawning areas. Clear Creek spring-run adult escapement was the lowest ever with only 9 redds counted.
15) David Colby (USFWS) summarized adult steelhead and Chinook monitoring on Clear Creek and Battle Creek. David noted that they will be installing the spring-run/fall-run segregation weir on Clear Creek in August. They are also monitoring the movement of adult spring-run up Clear Creek during pulse flows. On Battle Creek, of the 36 spring-run coded wire tags recovered, seven were Feather River spring-run and one was a Feather River fall-run.
16) Bob Null (USFWS) summarized USFWS involvement with telemetry studies using Coleman Hatchery fish. Bob has been monitoring the survival of both juvenile steelhead and post-spawn

steelhead adults. Bob noted that they are experimenting with new JSAT technology and can tag juveniles as small as 80mm.

17) Matt Johnson (PSMFC) will be starting the winter-run carcass in May.
18) David Grant (DWR) is working with UC Davis to assess the abundance and distribution of adult green sturgeon in the Sacramento River. They started their survey in April and had detected individuals, but not large aggregates.
19) Robert Vincik (DWR) reported on the results of the American River carcass survey. He noted that the survey was disrupted by high flows. They were only able to survey 9 weeks of the 15 week survey. Robert is also responsible for the operation of the Knights Landing rotary screw traps. The screw traps operated throughout the year.
20) Jim Smith (USFWS) noted that water conditions in the Sacramento River system are really good along with water temperatures and foresees that good conditions will continue into the fall. Jim noted they will be implementing flow actions in the Delta.
21) Tom Kisanuki (USBR) sent an email update on the USBR funded gravel monitoring program being conducted by North State Resources (see Tom's 5/13 email)
22) Randy Baxter (USFWS), under the IEP program, is characterizing the movement of juvenile fish in the lower Sacramento River and Delta. Report to come out in IEP news. Randy is interested in collaborating with people upstream on work involving native minnows. Any takers?
23) Jack Ingram (USFWS) summarized studies in the Delta, including genetic studies of Chinook captured at the Chip's Island and Sacramento Trawls to determine race, Delta smelt movement in relation to turbidity (near shore vs mid channel), the combined study on the San Joaquin River (Temporary barriers study, VAMP, and the 6-year Steelhead study), and sturgeon spawning study on the San Joaquin River.

Presentations:

Fall-run Dewatered Redd Survey from Keswick to Balls Ferry – ***David Grant, DWR and Doug Killam, DFG***

The purpose of this survey is to provide an estimate of the number of redds that become dewatered when releases from Keswick Dam are reduced to low levels (below 5,000 cfs) during the fall- and late-fall-run spawning and incubation period. This is a collaborative effort between DWR, DFG, PCFMC, USFWS, and USBR

Up until now, observations of redd dewatering on the Sacramento River have been made, but a focused empirical assessment of redd dewatering of fall-run redds has not been carried out. Doug confirmed redd dewatering had occured in 2003 by excavating eggs in what appeared to be a dewatered redd.

During the 2010/2011 season, DWR and DFG worked together to developed a protocol that includes marking fall-run redds to distinguish them from winter- and spring-run redds and describe the level of dewatering (i.e., completely exposed, pot wet, pot dry, tail exposed). During low flow conditions

in 2008, 2009, and 2011, DWR with assistance from DFG also identified and delineated dewatered areas that have the potential to provide spawning habitat under normal flow conditions.

Bob Null commented that curtailment of flows also affects the hydrology around a redd and dewatering does not necessarily need to occur for flow curtailments to negatively impact incubating eggs and fry.

Jim Smith noted that studies have shown that eggs and fry can survive some level of redd dewatering.

Juvenile Salmonid Monitoring in the Middle Sacramento River ***Colin Purdy, DFG***

In August 2010, DFG began rotary screw trap monitoring at two locations in the Middle Sacramento River. The downstream most site is upstream from the Tisdale Weir. The other site, which is no longer in operation, was at the Maxwell pumping plant just upstream from Moulton Weir. Monitoring over the last year was funded by DWR's North-of-the-Delta Off Stream Storage Program. Funding over the next year, and possibly thereafter, will be provided by DWR State Water Project Operations to meet obligations under the OCAP RPAs.

Colin noted the significance of monitoring within this reach of the river for juvenile Chinook. Flows within this reach of the river are not significantly attenuated by diversions into the bypasses and fish movement in relation to flow can be examined in much greater detail than at stations lower in the river. Colin observed that flow had a big impact on how all runs of Chinook moved. Catches were high at peak flows or on the downward swing. Also, when the weirs are flowing, substantial numbers of juveniles may be swept into the Sutter and Yolo Bypass. Monitoring at these locations gives us the ability to sample the population at high flows before a portion of the population is split off into the bypasses. From this we can get an idea of how many and which fish are entering the bypass. Having these stations would allow DFG to look more closely at the effects of temperature on movement of juveniles.

DFG was able to conduct two trap capture efficiency trials, but not enough to cover all conditions experienced at the monitoring sites. More time is needed to establish trap efficiency.

Operating screw traps in this section of the Sacramento River is challenging due to the amount of debris, variability, and extreme high flows. Colin and his team have made huge progress in understanding the logistics of sampling in the middle river and see continued monitoring in this section of river as highly important

Bank Swallow Status, Trends, and Conservation – ***Joe Silveira, USFWS***

Joe provided an overview of the Bank Swallow (BANS) population in California. Most of the State's BANS population occurs on the Sacramento River below the Keswick Dam and the Feather River below the Afterbay Outlet. However, the majority of its habitat occurs along 100 miles of the

Sacramento River between Red Bluff (RM 243) and Colusa (RM 143) where over 70% of the BANS population occurs. The population has experienced a precipitous decline in 2009 and 2010 (34% decline). Rocked or rip-rapped bank is the culprit– over 48% of the eroding banks have been rocked between Red Bluff and Colusa. Examples of these are River Mile 182 (DWR project) and River Mile 233.5 (private staged rock project).

To address these problems the Bank Swallow Technical Advisory Committee (formerly known as the BANS Working Group) formed. The TAC includes agencies (USACE, CDWR, CDFG, USFWS), NGO's (TNC, PRBO-Conservation Science, River Partners), and university and other researchers (CSU Chico, UC Davis). The TAC focuses on issues of BANS habitat protection, restoration and management, monitoring and research, and data storage and retrieval, and communication.

Greg Golet, with The Nature Conservancy, noted that the TAC has been successful in communicating early with agencies (ACE and DWR) to find other alternatives to projects that would otherwise degrade, damage, or remove BANS habitat.

DWR is currently funding the facilitation of the TAC through the Flood Safe Ecosystem and Statewide Resources Office (FESSRO). FESSRO is planning a conservation strategy as part of the State Plan of Flood Control. An EIR/IS for the State Plan of Flood Control is due out in 2012. Adam Henderson is the FESSRO contact in DWR's Northern Region Office.

Behavior, Habitat Use, and Site Fidelity of Adult Green Sturgeon using Acoustic Telemetry – ***Michael Thomas, UCD***

Mike used ship-board telemetry methods to track tagged green sturgeon in the Sacramento River to assess habitat use and site fidelity. Mike used an approach known as "first passage time" (FPT) to provide an objective measurement of site fidelity and habitat use. Through past studies, river habitats deeper than five meters have been identified as preferred by green sturgeon. Mike observed that green sturgeon moved through many units greater than five meters deep, but utilized only a few of those that were available (had high FPT). Mike will be doing further research with Alex Hearn to take velocity, flow direction, and bathometric measurements at high fidelity sites to assess the habitat characteristics that might attract green sturgeon. During Mike's research, another aggregate site was discovered at River Kilometer 498.7 above China Rapids. More investigation needs to be done to determine if this may be a spawning site as well.

Jim Smith thought the China Rapids site could be a resting site because of the high velocities experienced through China Rapids by migrating fish.

Bill Poytress noted that it is possible that fish may redistribute themselves after spawning, so may they may have fidelity for different areas pre- and post spawn.

3D Fine-scale Movement of Green Sturgeon using VRAMP – Pilot Study – ***Alex Hearn UCD***

Alex tested the VRAMP system in the Antelope Creek green sturgeon holding/spawning site to gather data on the fine scale movements of tagged green sturgeon within the site. He was able to

successfully deploy the system, gather data, and delineate vertical and lateral movement. Alex will be expanding his study to other sites on the river this year. Alex's habitat measurement of habitat characteristics will complement this work as well.

Modeling and Monitoring of Hydraulic and Sediment Conditions at East Sand Slough – *Paul Frank New Fields*

Paul described the monitoring and modeling his team has conducted to plan and design a side channel project at East Sand Slough in Red Bluff. The side channel will be build this year to mitigate for the loss of wetland and riparian habitat that occurred as a result of the construction of the pump, screen, siphon, and bridge that is part of the Red Bluff Fish Passage Improvement Project. Paul's team measured surface water/groundwater interactions to determine the elevation of groundwater at different flows. Results are being used to assess the type of vegetation the site could support. Paul also presented results from the assessment topographic of historical, recent, and post 2011 ~100,000 cfs event cross section data. They determined there was no substantial bed movement or deposition at the project site. During project development, concerns were raised about the potential for flood events to deposit large amounts of sediment in the constructed side channel and fill or cause the need for frequent maintenance. The results provide re-assurance that the flood channel will not be filled by flood events and it will not require frequent maintenance to meet project criteria.

Next Year's meeting will be on March 22, 2012 and coordinated by the USFWS-Red Bluff.

4/28/11 Upper Sacramento Monitoring PWT

Name	Affiliation	Phone	Email
Aric Lester	DWR, Red Bluff	530-529-7365	alester@water.ca.gov
Bill Poytress	USFWS, Red Bluff	530-527-3043	bill_poytress@fws.gov
Jane Dolan	Sac River Conservation Area Forum	530-586-7411	jdolan@water.ca.gov
Richard Corwin	USBR	530-528-0512	rcorwin@usbr.gov
Alex Hearn	UC Davis	530-400-7475	arhearn@ucdavis.edu
Erin Collins	DFG, Sacramento	916-227-8029	ecollins@dfg.ca.gov
Mike Brown	DFG, Fisheries Branch	916-227-4989	mbrown@dfg.ca.gov
James Lyons	DFG, Fisheries Branch	(530)529-3295	JLyons@DFG.ca.gov
Mike Thomas	UCD	(530)752-5372	mjthomas@ucdavis.edu
Jim Earley	USFWS, RB	530 527 3043	james_earley@fws.gov
DAVID J. LOLBY	USFWS, RB	530 5273043 EXT257	david_colby@fws.gov
Bob Null	USFWS, Red Bluff	530527-3043 X229	Robert_Null@fws.gov
Matt Johnson	PSMFC, RB	530 527-8992	MJohnson@dfg.ca.gov
Darin Olsen	PSMFC, RB	530-527-8992	dOlsen@dfg.ca.gov
Dale Morrison	PSMFC, RB	530-736-9264	dmorrison@psmfc.org
Colin Purdy	PFG, NCR	916.358.2832	cpurdy@dfg.ca.gov
Robert Vincik	DFG, NCR	916-358-2933	rvincik@dfg.ca.gov
Diane Coulon	DFG NCR	530-895-5002	dcoulon@dfg.ca.gov
Paul Frank	New Fields	5105080248	pfrank@newfields.com
Jim Smith	FWS- Red Bluff	530-5273043	Jim_Smith@FWS.gov
Tom Kisanuki	BOR Shasta Dam	530-276-2046	tkisanuki@usbr.gov
TRICIA PARKER HAMELBERG	USFWS RedBluff	530-527-3043 x248	TRICIA_PARKER@fws.gov
Joe Silveira	USFWS Sacramento NWR complex	530-934-2801	joe_silveira@fws.gov
Bruce Oppenheim	NMFS, Sact.	916-930-3603	bruce.oppenheim@noaa.gov
Chris Mayes	USFS, Lassen NF	530-258-5176	ctmayes@fs.fed.us

NAME	AFFILIATION	PHONE	EMAIL
RYAN FOOTE	USFS	530-258-5169	RFOOTE@FS.FED.US
Colleen Harvey-Arrison	CDFG	530-527-9490	charvey@dfg.ca.gov
AMY LYONS	DWR	530-528-7439	alyons@water.ca.gov
PETER COOMBE	DWR	530-529-7377	pcoombe@water.ca.gov
Gary Diridoni	BLM	530-224-2184	gary_diridoni@ca.blm.gov
Doug Killam	DFG	530-527-8893	dkillam@dfg.ca.gov