

# Upper Sacramento River Monitoring Project Work Team

## 2017 Annual Meeting

### March 22, 2017

Hosted by US Fish and Wildlife Service, Red Bluff Fish and Wildlife Office  
Moderated by James Earley, USFWS; Notes by Josh Gruber, USFWS

**Welcome to FWS-RBFWO** AFRP Habitat Restoration Coordinator *Jim Earley* welcomed the group - The USRM PWT was formed in the mid-1990's and now meets annually to coordinate fishery monitoring work in the Upper Sacramento River and to avoid duplication.

#### **Attendees:**

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## Roundtable Updates

### **Tricia Bratcher; CDFW; AFRP Updates**

- Collected data on the effects of marijuana cultivation on anadromous fish within Deer Creek. Waiting on results. Study was funded by AFRP and Regional Water Quality Control Board.

### **Matt Johnson; CDFW; Adult escapement on Antelope, Deer, and Mill Creeks**

<b>2016 Adult Chinook Salmon Population Estimates</b>		
	<b>SCS</b>	<b>FCS</b>
<b>Antelope Creek</b>	7	138
<b>Deer Creek</b>	331	253
<b>Mill Creek</b>	175	602

#### **? Discussion ?**

- Any stranding surveys conducted on these creeks?
  - ☞ Matt indicated no fish rescues had been conducted on these streams.

### **George Edwards; Fish Screen Passage CDFW Fisheries Branch; Update on screen and unscreened diversions**

- Data from this update is provide to the Passage Assessment Database (PAD) maintained by PSMFC. The PAD contains information from state, federal and other agencies on the location and types of barriers to fish passage (primarily salmon and steelhead) in the state of California.
  - Surveys were conducted in 2015 (Mouth of Sac to Deep Water Shipping Channel) and 2016 (Deep Water Ship Channel to Keswick).
  - Identified 115 screened; 676 unscreened diversions; 891 total diversions.
    - Unscreened diversion size opening: 1”- 48” openings
      - Generally 1”-16” upper system; 16”-48” Lower system
    - 145 unscreened diversions above Colusa
    - 105 unscreened diversions above Princeton (mostly 1”-12” size)
    - ERIMS Electronic (not sure why I have this in my notes)
    - Contact George if you are looking for specific data.
  - 2017 Plans
    - Survey from Delta to Mouth of Sac into Suisun Marsh.
    - Obtain info on pump size, timing and diversion rates across entire sample area but they are limited by landowner willingness to provide info or permission. Oftentimes landowners are reluctant to provide either due to fear of consequence if loss is determined.
    - eWrims is the California Water Resources Control Boards electronic Water Rights Information Management System database that lists all of the water rights in the state of California with owner information, area where point of diversion is located and any yearly reports on the amount of water diverted at the site. The diversion owners are supposed to provide a yearly report to the Board. We search the database files for information on the CFS (cubic feet per second ) of water diverted at the site. Often the information isn’t available for pre 1914 water rights and some water rights thereafter.

#### **? Discussion ?**

- How do you visually determine if it’s a screened or unscreened diversion?
  - ☞ Based on infrastructure. Most screened are on tracks. Unscreened are difficult to see...
- Will the information be used to screen these diversions?

- Unscreened diversions pre 1972 that are <250 cfs the department has to pay 50% of the cost to screen. Typically out of the Fish and Game Preservation fund which currently don't have funds to pay those cost. Therefore they are using the information from this study to focus in on fixing the large diversions. Diversion post 1972 any new diversions of water from a stream having populations of salmon and steelhead that is determined by the department to be deleterious to salmon and steelhead shall be screened by the owner. The construction, operation or maintenance costs of any screen required will be borne by the owner of the diversion.
- Are studies being done to determine how many fish are being taken by these diversions?
  - Vogel 2013 showed few salmon captured in the few sites he monitored but much of the monitoring was done in 2010 which was a high water year. Vogel noted fewer salmon where captured then the previous years
  - Vogel 2013 Evaluation of Fish Entrainment in 12 Unscreened Sacramento River Diversions. Prepared for Central Valley Project Improvement Act Anadromous Fish Screen Program and Ecosystem Restoration Program. July 2013. 162 p. with appendices. Available at: (<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=88888>).

### **Don Baldwin; CDFW; Steelhead PIT tagging Operations**

- Steelhead Fyke Trapping Update (winter of 2016?)
  - 7 sites were sampled with large wire fyke traps between the mouth of the American River to Clarksburg.
    - Two sites were added to replace the two sites lost due to access issues.
  - Only 10 days were unsampled (January 8<sup>th</sup> – 13<sup>th</sup> and February 6<sup>th</sup> – 11<sup>th</sup>) due to high flows.
    - However only three traps were sampled during high flows because the river elevation was too high to get the boat under the Freeport Bridge and limited levee access.
  - 35 adult steelhead (380-780 mm FL) were collected and genetic samples were taken
    - 33 Hatchery origin (pit and floy tagged); 2 wild (pit tagged only).
    - 2015-2016 season fish captured were from Nimbus Hatchery
    - This year fish captured were smaller and may be from Upper River Hatcheries
    - Most captured fish seem to be true CV steelhead origin hatchery steelhead, very few large Nimbus hatchery steelhead have been captured
  - Number of fish tagged in fyke traps recaptured at Hatcheries
    - Nimbus Fish Hatchery 16 tagged recaps.
    - Feather River Hatchery 2 tagged recaps
      - One fish tagged on Feather was later detected at Nimbus Fish Ladder
    - Coleman NFH 1 tagged recap.
  - Summary
    - Mostly hatchery fish are being collected but the overall proportion of the population that is collected is small.
    - Fish are detected in the hatchery one to two months after being collected in the fykes.
    - During a Dec high flow event with high turbidity and debris load, one Steelhead was caught and tagged on 12/13/16 then detected at the hatchery on 12/17/16 (~30 rms)
    - High flows seem to move the fish closer to the river banks.
    - No fish are being recaptured in fykes making them wonder if trap avoidance is a learned behavior.
      - During low water or drought conditions fish maybe avoiding the fykes (visually?). Planned acoustic studies to evaluate this idea.

- 2 sea lions have been found inside the traps. Measures are being taken to prevent them from entering due to harm to sea lions and potential predation impacts on catch (unknown).
- Goal is to increase pit tag arrays to determine movements of Steelhead within the freshwater system.
- Funding cuts have limited creel survey staff so anglers information is no longer available.

### ? Discussion ?

- How many CNFH fish did you collect?
  - ☞ Won't know until the end of the summer when genetics are processed. Of the 33 fish collected, we estimated 20 fish from Feather and Coleman Hatchery based on phenotype. However lots of that came into American River Hatchery early were possibly of Central Valley stock based on phenotype.
- Do you have a targeted number of fish you hope to collect within this three year study?
  - ☞ No targeted was ever really set. The goal of the project is to determine if this method has the ability to effectively collect fish. Currently we are evaluating locations to determine if they can contact more fish or possibly they may need to try a different method to obtain enough fish for mark recap study.
- Additional discussion was had about PIT tag types, array design and locations. Contact Don Baldwin and Jonathan Nelson (CDFW) for details.
  - ☞ 23 mm HDX PIT tags are being used on adult steelhead captured in large wire fyke traps. 12 mm and/or 23 mm HDX PIT tags are used on juveniles captured during fish rescues. Biomark PIT tag antenna array technology used in tributaries and hatchery fish ladders will detect both HDX and FDX PIT tags. PIT tag antennae are multiple wraps of wire in 4" schedule 80 sealed PVC pipe approximately 15 or 20 ft. long by 2.5 ft. wide. These antennae are connected together to span the stream, anchored flat to stream bed so fish can swim over them. Two rows of antennae are anchored 5 to 15 ft. apart to detect directionality and redundancy.
  - ☞ PIT tag antenna is installed on Nimbus Fish ladder. The plan is to install antenna at all 4 CV hatcheries.
  - ☞ Bear Creek antenna is currently being installed
  - ☞ PIT tag antenna are not incorporated into RB weirs because juvenile *O. mykiss* can swim through weir panels without being detected.

### **Thomas Clifford; PSMFC; Steelhead Monitoring**

- 2015-2016 SH monitoring in Bear Creek resulted in an escapement of 310 *O. mykiss* >16". Bear Creek is currently being monitored for steelhead this year 2016-2017
- Clear Creek is currently being monitored for SH. Clear Creek escapement estimates are being evaluated.
- 3 new resistance board (RB) weirs were built and installed for 2016-2017 (Battle, Cow, Cottonwood creeks)
- Vaki Riverwatcher was installed in the Deer Creek south fish ladder this fall with promising results.
- CVSMP purchased 3 more Vaki Riverwaters; 1 for the Yuba River, 1 for Antelope Creek, 1 experimental potentially for an r-board weir (Clear Creek)
- CVSMP RBFO built a PIT tag array for Bear Creek
- CVSMP RBFO has plans to install swim-by PIT arrays in Battle, Cow, Cottonwood and Clear creeks within the next year

- CVSMP RBFO has plans to install swim-through PIT arrays at Mill and Deer creek fish ladders within the next year. We also have plans to install swim-through PIT arrays on smaller Upper Sacramento River tribs (Middle, Salt, Sulphur and Olney creeks)
- CVSMP RBFO will begin a juvenile monitoring program that includes RST trapping (April – June; Sept to Dec) in Bear, Mill, and Deer creeks to capture and PIT tag outmigrating *O. mykiss* smolts.
- Most recently, CVSMP RBFO has been assisting in fish rescue/fish stranding surveys to capture and PIT tag Upper Sacramento River *O. mykiss*. Over the last few weeks we've tagged 31 *O. mykiss*.

#### ? Discussion ?

- Will RST work be used to collect Chinook out-migrates?
  - ☉ Yes dual purpose trapping efforts will be done on Bear, Mill, and Deer creeks for *O. mykiss* PIT tagging and Spring Chinook JSATS tagging in conjunction with NOAA

#### Chris Mckibbin; CDFW; Weir and Bypass Stranding Survey Summaries

- Moulton Weir (Sutter Bypass); spill apron and adjacent pools directly downstream of weir apron
  - Date: March 9, 2017
  - Relocation Totals: 2 juvenile fall-run, 2 juvenile spring-run

Comments: Juveniles were identified using length at date criteria. Moulton Weir spilled for a period of 41 days and this was the first time CDFW North Central Region Office conducted regular monitoring for stranded fish at this location. Due to the smaller size of this weir, and it's generally infrequent overtopping events (it is one of the last flood relief weirs to spill), fish stranding here does not appear to be as significant compared to other weirs based on these initial experiences.

- Fremont Weir (Yolo Bypass); spill apron and adjacent pools directly downstream of weir apron
  - Dates: March 12-17, 2017
  - Relocation Totals: 249 juvenile FCS, 21 juvenile SCS, 7 juvenile WCSA, 14 yearling RBTA, 1 male WST (160 cm), 1 female GST (185cm)

Comments: Juvenile salmon were identified using length at date criteria. The rescued yearling steelhead received a PIT tag and the adult sturgeon received 10 year Vemco V16s. Fremont Weir spills on average once a year, however spill duration is variable; during dry years a spill event may occur for only a few days while in wet years (like this year) it may spill for 70 days or more. The longer duration of spill generally results in a greater amount of stranded species, life stages and numbers of fish. Rescue efforts occurred March 12-17 immediately after the weir stopped spilling, however flooding flows once again crested the weir which will necessitate future monitoring and likely rescue efforts.

- Tisdale Weir (Sutter Bypass); spill apron and adjacent pools directly downstream from the weir apron within the Sutter Bypass
  - Date: March 16, 2017
  - Relocation Totals: no fish have been gathered and relocated yet

Comments: Tisdale Weir is the first flood relief weir to overtop and spills more frequently and for longer duration compared to others; this year Tisdale Weir has been inundated for 80+ days. On March 16, flows stopped cresting Tisdale Weir and CDFW field staff started monitoring for stranded fish. Adult salmon, sturgeon as well as a mix of other species were observed within the weir apron. CDFW Law Enforcement stayed in the area to prevent poaching, while biologists prepared for fish gathering and relocation. Before rescue efforts were initiated the Sacramento River again crested Tisdale Weir on March 22; hopefully any stranded fish have volitionally swam into the river. Stranding monitoring and likely rescue efforts at Tisdale will be needed later in the season.

#### ? Discussion ?

- Have you identified the value of these fish rescues?
  - ☉ See attached Thomas et al 2013 which describes the value of rescuing green sturgeon (discussed at the meeting). The article provides context as to why CDFW has been so active with rescue efforts.

- Can you give any updates on the information gained on recovered fish.
  - Adult salmonids are externally tagged with grey colored, uniquely numbered anchor (Floy) tags while adult acipenserids are given internally planted, uniquely numbered acoustic transmitter tags (Vemco 69kHz, V 16). A few observations of rescued fish in 2016 include: a Chinook salmon rescued at Tisdale Weir appeared at Livingston Stone NFH and was used for spawning, a Chinook salmon rescued from Tisdale Weir was found during the Butte Creek carcass survey near spawning grounds, a white sturgeon was tracked moving downstream and entering the delta after being rescued at Tisdale Weir and a green sturgeon was tracked moving upstream to the Sacramento River near Colusa after being rescued at Fremont Weir. CDFW Region 2 office creates an annual summary of rescue efforts which is available if you are interested.
- Any updates on Fremont weir fix.
  - Currently project designs are 60% or better to widen and deepen the fish way on east side of Fremont Weir. Design plans include mechanically operated “Obermeyer bladder” gates to open/close the fish way in a more fish friendly manner and sonar imagery cameras to record fish movements in and near the fish way. Other plans for the reconstructed fish way include operating the gates to entrain juvenile salmonids on the Yolo Bypass at a greater frequency/longer duration than what currently occur, but these plans are still being developed and are likely several years away from implementation.
- What is the status of the proposed plan to take rescued adult WCS to LSNFH for broodstock?
  - The management agencies agree with the idea, but plans are still being worked out between NMFS, USFWS, and CDFW. Logistics would include; rescuing the fish, gathering a tissue sample, holding the fish in-river at a secure location, evaluating genetics as quickly as possible to determine race/origin and then if identified as winter Chinook, transport of the fish to the hatchery.

**Jason Julienne; CDFW; Knights Landing and Tisdale RST Update.**

- Daily catch data for both Knights Landing and Tisdale are now available on the CalFISH website
  - <http://www.calfish.org/ProgramsData/ConservationandManagement/CentralValleyJuvenileSalmonandSteelheadMonitoring.aspx>
    - Daily catch spreadsheets are available under the Data Access tab
- Knights Landing RST sampling began 8/9/16 (earliest start date from memory)
  - WCS in first couple trapping efforts.
  - Limited down time due to high flows
  - Year to date catch totals
    - FCS: 4,494; (2016 Season total: n=16,623)
    - SCS: 247; (2016 Season total: n=909)
    - WCS: 177; (2016 Season total: n=53)
    - WCSA: 23; CWT confirmed
    - LCS: 18; (2016 Season total: n=0)
  - Genetic testing to confirm SCS and Larger fall run race.
- Tisdale sampling
  - Sampling began on 9/4/2016
    - First WCS captured 9/9/2016
  - Catch totals through 3/22/17
    - FCS 1,696; (2016 season totals: n=?)
    - SCS 132;
    - WCS 82;
    - LCS 5;
  - No genetic testing at this time. Anticipated for 2017/2018 sampling season

**Shig Kubo; CDFW; Fish Salvage in Colusa Basin and Wallace Weir.**

- Fish salvage operations have been occurring since fall of 2013 and 2014, when 300 adult salmon mainly adult WCS were rescued.
- Straying occurs when Sac River flows are low and Yolo Bypass discharge in the Cache Slough Complex is high and amplified by tidal influence
  - Installed resistance board weir 11 miles north of Colusa near the town of Dunnigan and a fyke trap downstream of the old Wallace Weir site in the Knights Landing Ridge Cut Slough.
  - Season totals: 1731 chinook adults to date; 25% adclipped; Captured during fall run timing (Oct to Dec)
  - Assumed to be FCS. DNA and CWT indicate 274 FCS, 5 WCS, and 17 SCS (questionable based on timing and genetic data, 8 captured in Nov were Feather River fish, likely FCS from FR Hatchery)
- 2017 Trapping
  - Trap installed November 8, fished until Dec. 10 due to high flows (~2000 cfs at yolo bypass near Woodland, CA).
  - 117 chinook; Likely FCS; awaiting genetic analysis but fin clips were collected.
  - Trapping efforts were moved downstream from Wallace Weir due to improvements to Weir. New weir should help trap longer into WCS and SCS migration period.

**? Discussion ?**

- Will any effort be put forth to identify if there are any stranded fish within canals near refuge since no trapping operations were conducted during their migration period?
  - ☉ Roving DIDSON surveys in the upper portions of the Colusa Basin Drain have been implemented in order to document fish stranding in the area.
  - ☉ To date there is no indication of fish in the area. Traps will be reinstalled when conditions allow.

**Matt Brown; Charles Chamberlain; Jim Earley; Sarah Gallagher; USFWS; Monitoring updates on Battle and Clear Creek**

**Battle Creek**

- As a result of the Ponderosa Fire (2012), large amounts of fine sediment have entered south fork of Battle Creek filling in holding pools and covering spawning areas. Last fall (2016) a barrier weir was installed at the mouth of SF Battle creek to prevent SCS from entering this area during spawning. Conditions have improved, pools and a defined thalweg are reforming.
- A new study, potential spawning area mapping (PSAMs) is being used to identify where spawning gravel is currently located to direct future restoration efforts.
- 2016 SCS escapement: 180 adults; ~ historic average.
- During drought years SCS redd estimates have been < expected based on # of adults observed. Improvements were observed this year season likely due to lower water temps. (2017: 57% vs ~30% prior years).
- River flows have impacted our abilities to monitor juvenile passage.
- 2017 estimates 100 juveniles/redd; historical average ~700 juveniles/redd. Likely low due to inability to sample.
- Priorities for AFRP charters should keep in mind monitoring for steelhead, sturgeon, other species to identify needs evaluating actions that we decide. Monitoring folks should Partner up with restoration folks to help evaluate their actions.

**Clear Creek**

- Restoration efforts
  - Floodplain site, Phase 3C, in design build contract. Target construction in 2018.

- Phase 3B completion project; put finishing touches on the project, especially riparian and wetlands work that didn't get completed with initial construction due to state bond crisis.
  - Gravel injection piles have been moved by high flows of this winter. Good time to replenish those.
  - 2017 gravel injection planned for 4 sites (Guardian Rock, Paige Bar, Placer Road Bridge, and Rootwads).
  - Permitting and design work continues for the Lower Clear Creek Aquatic Habitat and Mercury Abatement project. Primary objectives include reducing mercury in the watershed, and providing a long term supply of gravel for Clear Creek gravel injections.
  - **Adult Monitoring**
    - 2016 SCS lower than previous years (n=29).
    - Graphic of adult migration (LF, SCS, STT, LMP) within the creek.
    - 2017 higher flows affected monitoring because Sacramento River flows backed up into the creek covering the weir for about a month. Weir has been repaired for SCS monitoring.
    - For the fall run Chinook Salmon population, there are a lot fewer hatchery fish "strays" on Clear Creek this year. Hatchery fish comprised about 30% as compared to previous years where the hatchery contribution was more like 60%.
  - **Juvenile Monitoring.**
    - Had three of the highest flows recorded on the Clear Creek since 1998. (i.e., flows >5k cfs)
    - SCS: 20 redds observed. Given that number of redds, we would expect to trap about 4,000 juveniles; Trapped 3,800 juveniles
    - FCS: 2,800 adults observed; Given that number of adults observed, expect to trap about 600,000 juveniles; trapped ~50,000 juveniles.
    - Low numbers likely due to frequent inability to operate the trap during high flows experienced through the emigration period.
    - Population estimates ~860 k vs 2.5 million expected.
- ? Discussion ?**
- How much time did it take to repair weir?
    - ☞ Two days with a large field staff including State and Federal employees.
  - Will you look at how juveniles are using habitat within the creek?
    - ☞ A juvenile habitat use study employing snorkel surveys will address this in the next few months. Weather has delayed the start of these surveys.
  - Did you track gravel movement and or impacts related to buried redds or impacts to spawning habitat?
    - ☞ We make no attempt to quantify buried redds. We are directly mapping spawning gravel.
  - Do you think temps effected juvenile survival in the creek?
    - ☞ Last year temps were really high for fall run in CC due to high temps within Whiskeytown Reservoir. The Oak Bottom Temperature Curtain in Whiskeytown Reservoir was restored in May 2016 which is a little late, and cold water transfer from Trinity River was very low due to low storage conditions in that system. The benefits of the restored temperature curtain should more apparent in future years.

**Shawn Sanders and Todd Miller; USFWS; Delta Juvenile Fish Monitoring Program.**

- Significant programmatic changes during hiring surge
  - Approximately 50% staff turnover of 45 employees in the DJFM program. New Employees as follows: Program Manager, Julie Day (previously worked in the Klamath Basin for USFWS), Supervisory Fish Biologist, Shawn Sanders (previously Iron River NFH and Coleman NFH – USFWS), Adam Nanninga (previously Lahontan NFH – USFWS), three new "national hire" Fish Biologists, and Seventeen (17) – Term/Seasonal Biological Science Technicians.



- Currently spending significant time training new staff, both on safety topics and to address sampling and data management consistency.
- Potential collaboration with USRM groups on topics that have relational value (i.e. anadromous species monitoring)
- Past spring conducted 75% of the trawls
- Beach seines are at 50% effort due to high water.
  - Issues with aquatic vegetation will hopefully be reduced due to high winter discharge
- Enhanced Delta Smelt Monitoring EDSM
  - Project Goals of project: Targeted Delta smelt sampling to provide more accurate information for Ken Newman's Delta smelt life cycle model (LCM) for assessing and predicting effects of management actions on the Delta smelt population, (2) provide near real-time data for water managers through real-time sampling and reporting, and (3) Come up with more accurate estimates of the Delta smelt population.
  - Starting in early April trawling will shift to 20mm sampling to target post-larval Delta smelt. In addition to obtaining quantitative estimates on distribution and abundance, this effort will also explore methods for sampling deep and shallow waters to increase coverage of the population.

**Bill Poytress; USFWS; RBDD RST Juvenile Production Estimates**

- Juvenile salmonid monitoring at RBDD has been a little hit and miss in 2017 due to high flows. We did randomly sub-sample portions of the day and night in flows up to 42k cfs in January and February. Lack of samples effects the precision of our brood-year 2016 fall run estimates primarily with resultant wide confidence intervals. The current FR estimate through 3/11/17 is 8.9 M (2.3 to 22.3 M 90% CI).
- Brood-year 2016 winter-run Chinook Salmon is currently estimated at 531,370 (382,689 - 680,051 90%CI) and will change very little for the remainder of the year. We are still seeing some winter-run sized fish (including adclips) since we redeployed traps a couple weeks ago after flows from Shasta/Keswick were reduced from 70kcfs. The current egg-to-fry survival estimate for BY16 WR is 24.6% using the fry-equivalent estimate. This compares to 23.7% (20 yr ave) and 4.5% and 5.9% for BY 15 and BY 14, respectively.
- Pathogen testing by USFWS' California Nevada Fish Health Center in 2016 revealed low levels of pathogens from winter Chinook juvenile samples during the 2016 outmigration period. In contrast during 2015 high levels of *Ceratomyxa shasta* and *Parvicapsula minibicornis* were detected in juvenile winter Chinook samples [and late-fall Chinook sentinel fish from CNFH].
- Larval Green Sturgeon Catch and associated relative abundance indices in 2016 was the highest recorded over the last 20 years. We reduced sampling effort to 19% as we sought and later received a NMFS Section 10 permit amendment to allow for greater catch (was set at 3,000 fish, now 6,000/yr). The Green Sturgeon relative abundance index for 2016 was valued at ~31 fish/acre-foot of water sampled. This compares to a median value over the last 20 years of 2.3 fish/acre-foot sampled. DIDSON-based adult distribution data indicated 71%:29% were above RBDD:below RBDD in 2016, compared to an average of 44%:56% in the years 2010-2015. Larval sturgeon were collected in September this year, which has never been observed before.

**Email update from Josh Israel; USBR; SacPAS website.**

- I will not be able to attend the meeting next week, but wanted to provide an update on the topic I presented on last spring: web based services to link data and science to in-season management. Significant advances have been made to data queries and the fish passage model at <http://www.cbr.washington.edu/sacramento/>
- Here are some of the functions now available related to juvenile monitoring:

Juvenile Sampling

Delta Juvenile Monitoring

Delta Salvage

Delta Loss

Delta Loss CWT Tables

Red Bluff Daily Table with Biweekly

Red Bluff Daily Graph with Biweekly

Red Bluff Migration Timing and Conditions

- Here is also a recent IEP workshop presentation on SacPAS and the fish passage model. If anyone has ideas on how to expand this effort, we will be continuing to develop these tools over the next few years, and I would be happy to take your ideas. Please just email me and we can discuss further. If there is a technical team or group who would like to develop a particular topic, that would be something we can discuss too.

**Lunch Break**

**PRESENTATIONS:** (available upon request)

**Robert Chase; ACOE;** Update on permitting

- New Nationwide Permits (NWP) are out and are valid from March 2017- March 2022.
- Keep in mind safety and navigation in Section 10 waters when designing restoration projects.
- New NWP 27 (Aquatic habitat restoration) applications need to contain ecological reference to the surrounding environment i.e. large woody debris placement.
- New NWP 27 and NWP 4 there is now a 10 day wait for internal federal agency comments with up to an additional 15 day decision to permit based upon comments.
- Corps will be comparing NWP 27 project proposals to see if it fits into NWP 4 (Fish attraction, enhancement devices and activities) permit instead.
- Some passage projects will be double stacked with a NWP 3 (Maintenance).
- Will contact other program managers in the near future to discuss permitting for future projects.

**John Hannon; USBR;** CVPIA B13 Sacramento River Gravel Projects Status

- See presentations for status and updates on current gravel projects in the USRM area.

**? Discussion ?**

- What flows will these side channels flow?
  - ☹ Rancheria Island: ~4,200 cfs
  - ☹ Cypress: 3,250 cfs
  - ☹ Anderson River Park: design in progress, primary channels being designed to be perennial
- Aren't these highly used areas, how are you adjusting that public design?
  - ☹ The design criteria require the area to be useable by the public at most normal flows. It's a popular horse riding area.
- What types of features are you using to keep channels from closing off?
  - ☹ There are some hard structures (rock/wood) located at the top of each site that will help keep them open.
- Where is the excavation material going?
  - ☹ Most material remains on site. At some sites room is limited to so test pits are being evacuated as part of design process and to determine use for material (eg: could be used in landscaping). Hope is to not have to pay for materials to be transported off site.

- How prevalent are these side channels?
  - ☞ They appear to be less frequent above RBDD compared to below RBDD. Rancheria Island and Rancho Bregigau are examples of historic side channels where landowners blocked off the channel to increase the acreage of their properties. These sites appear to be relatively easy fixes and would add 3+ miles of habitat near the mouth of Battle Creek

**Ryan Revnak; PSMFC; B13 Sacramento River Projects – Redd Dewatering / Fish Stranding Monitoring**

- 2016 WCS red dewatering monitoring
  - 27 shallow water (< 24”) WCS redds.
  - Spawning range May 13 – Aug 22. Projected last emerged 11/14/16 based on ATU’s
  - 0 dewatered redds. Success!
  - Graphic on slide 3 show how data was used by water managers to prevent redd dewatering.
- 2016 FCS red dewatering monitoring
  - 101 shallow water redds between downtown Redding and Tehama
  - Spawning range Oct 17 – Nov 11.
  - 0 dewatered redds. Success!
- 2017 Stranding surveys
  - Purpose of the project is to identify what flows cause and where stranding is occurring. This year added lots of new data from flood release flows from Keswick.
  - Rescue effort numbers
    - ☞ Identified 134 sites; performed 54 fish rescues at 36 sites
    - ☞ 20 WCS natural origin
    - ☞ 136 WCSA
    - ☞ 1,1642 FCS
    - ☞ 63 RBT (juvenile)
    - ☞ 53 RBT (Adult)
- B13 monitoring to identify juvenile use related to John restoration projects (i.e, impact sites).
  - 84 snorkel surveys conducted at 14 sites 3 controls each control impact sites.
  - Limited effort expanded due to high flows. 1 survey in post cypress site.
  - Post construction observation numbers
    - 158 WCS
    - 5,000 FCS
    - 905 LCS
    - 5,293 RBT

**? Discussion ?**

- Will you look to see if this effort has any conservation benefit?
  - ☞ Not necessarily.
- Have you tried to estimate stranding or quantify what was stranded beyond counts?
  - ☞ No
- Looks like mostly beach seining?
  - ☞ Focusing on what permits allow and most effective technique for each area. Typically this is beach seining for most sites
- Genetic sample: Working with people to collect this data.
  - ☞ Currently we are focusing on collect and release. LAD criteria might not be exactly accurate due to conditions present in stranding pools.

**Doug Killam; CDFW; 2016 Upper Sacramento River Adult Escapement Monitoring**

- Mainstem Escapement Estimates
  - LCS: wasn’t great; n=3,085; 94% natural origin.

- WCS: not good; n=1,545; 70% natural origin. Compared historic average of 90% natural origin.
- FCS: bad really bad; lowest return in history; n=4,572; 62% natural origin. 96% adult
- FCS Tributary Escapement Estimates
  - Clear Creek: Terrible; Sad; Nothing compared to last 28 years n=2,418; 28% hatchery origin fish compared last year's 75%
    - Water temps in 2016 were not unfavorable for this area.
  - Cow Creek: Okay but a tough year for spawners and recovering carcasses; n=822; 93% adults,
  - Bear Creek: n=32
  - Cottonwood Creek: Better than last year; n=813; 93% adults 28% hatchery
- SCS Tributary Escapement Estimates
  - Beegum Creek: Bust since 2008: 0
  - North fork Cottonwood Creek 0
  - Battle Creek: Bad; 9,203; 97% adults.
- North fork Battle Creek barriers. Trying to find a design to remove a series of natural barriers. Multi-million dollar project.

**Bill Poytress; USFWS; Juvenile Green Sturgeon Outmigration Update**

- AFRP funded project that utilized a variety of gear types in 2014 and 2015 to determine an effective sampling method for age 0 juvenile green sturgeon for the purpose of gaining basic life history information to aid in the management of the species. Report covering 2014-2015 sampling efforts is available online at: [RBFWO website](#)
  - Targeted goals were
    - Devise non-lethal capture method
    - Determine temporal and spatial distribution patterns
    - Identify length and weight of over summering juveniles.
- Continued sampling was conducted in 2016 to tag (JSATs) and track juvenile sturgeon to determine migration cues and delta entry timing.
  - 19 juveniles were tagged
  - 18 of the 19 sturgeon were detected at or below the legal I80 bridge in Sacramento (Legal Delta)
  - Migrations appeared to be triggered by flow and turbidity.
  - Detections are still being gathered and analyzed
- 2017 efforts will continue to use benthic trawls to collect and tag juvenile green sturgeon. Additional receivers will be deployed to determine in-river habitat use as well as delta entry timing.

**? Discussions ?**

- You mention differences in length and weight between years. How do you reconcile determine temp or feeding success for differences in growth?
  - ➡ Preliminary analysis indicates that 2015 and 2016 linear models have different coefficients; which mechanics is driving that? Our analysis indicates at least the year difference.

**NEXT YEAR'S USRMPWT MEETING**

Next year's meeting: March 21, 2018  
 Host agency: USBR