

San Joaquin River Restoration Program
Restoration Goal Technical Feedback Group Meeting
Tuesday, November 17, 2009
California State University, Stanislaus
Turlock, CA

MEETING NOTES

Attendees:

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| Karim Abulaban | CA Department of Water Resources |
| Chris Acree | RSJ/SJVWLF |
| Brian Ellrott | NMFS |
| Michelle Banonis | Reclamation |
| Shannon Brewer | US Fish & Wildlife Service |
| Brent Cain | Brown & Caldwell |
| Ane Deister | Brown & Caldwell |
| Dan Easton | MBK |
| Dave Encinas | CA Department of Water Resources |
| Kevin Faulkenberry | CA Department of Water Resources |
| Ron Forbes | NCCFFF/OCSPA/Delta FF |
| Lisa Fotherby | Reclamation/TSC |
| Alicia Gasdick | Reclamation |
| Benjamin Gittleman | Kearns & West (recorder) |
| Blair Greimann | Reclamation/ TSC |
| Jason Guignard | FISHBIO |
| Katrina Harrison | Reclamation |
| Reggie Hill | Lower San Joaquin Levee District |
| Steve Haze | Sierra RCD/SJVWLF |
| TJ Kopschy | Central Valley Regional Water Quality Control Board |
| Shannon Leonard | URS |
| Bill Luce | Friant Water Users Authority |
| Mari Martin | RMC/Landowner |
| Sandy Matsumoto | Nature Conservancy |
| Scott McBain | SJRRP Technical Advisory Committee |
| Jeff McLain | US Fish & Wildlife Service |
| Rod Meade | SJRRP Restoration Administrator |
| Tom Miller | California Conservation Corps |
| Dave Mooney | Reclamation |
| Bob Mussetter | TetraTech-MEI |
| Leslie Mirise | NMFS |
| Reza Namvar | WRIME |
| Bruce Orr | Stillwater Sciences |
| Steve Ottemoeller | Friant Water Users Authority |
| Jeffrey Payne | MWH |
| Steve Phillips | USGS |

Attendees (cont.):

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| Stacey Porter | CDM |
| Rhonda Reed | NMFS |
| Erin Rice | Reclamation |
| Paul Romero | CA Department of Water Resources |
| Monty Schmitt | NRDC |
| Bill Smith | MWH |
| Tom Taylor | Entrix |
| Elias Tijerina | WRIME |
| Peter Vorster | The Bay Institute |
| Carolyn Yale | US Environmental Protection Agency |

MEETING SUMMARY:

Introductions (Reclamation)

Alicia Gasdick welcomed the group and reviewed the meeting agenda and goals. The meeting was intended to focus on the modeling tools and analysis being conducted for the San Joaquin River Restoration Program's (SJRRP) Program Environmental Impact Statement/ Report (PEIS/R).

NMFS Public Draft Recovery Plan for Central Valley Salmon and Steelhead (NMFS)

Brian Ellrott presented on the central themes, strategies and next steps of the Draft Recovery Plan, which was released for public review and comment in October 2009. The Plan is required by the ESA to provide a road map for recovery, containing objective criteria and guidance, with an attainable goal of delisting species; the Plan is not a regulatory document. Brian noted that the plan is intended to be long-term, that it will be updated periodically, and that it is intended to carry realistic goals (rather than restoring historic conditions). Brian discussed the diminishing populations of three species: winter-run Chinook, spring-run Chinook, and Central Valley Steelhead. The recovery strategy will be a two-pronged approach: to secure existing populations, and to reintroduce fish to historic habitats. Brian also outlined the next steps and future timeline for the plan. The 120-day public comment period will conclude February 3, 2010, after which all comments will be reviewed, and a final plan will be issued later in 2010.

The group noted the following:

- Further definition is needed on who the stakeholders are and whether outreach will be conducted at the agency level or externally as well. Outreach will include more than just interagency communication, and additional groups will be involved.
- A web link to the plan will be sent the group. CDs of the report were also brought to the meeting.

Background (Reclamation)

Dave Mooney reviewed the Settlement background and goals, and provided an overview of the SJRRP timeline, roles, and responsibilities. Dave indicated that the main purpose of this meeting is to present on the various models that will be used. Dave introduced the Modeling Subgroup, and noted that the group's goal is to select models and ensure that correct information is being

used for analysis.

Models and Analytic Tools

Hydrology Modeling (MWH)

Jeffrey Payne presented on CalSim, which will be used to test how land uses, infrastructure, and policies impact water supply. The CalSim model will help the SJRRP understand the range of operations for Friant Dam, impacts on the Central Valley Project and State Water Project supplies, and the range of recapture for potential recirculation. CalSim uses a monthly mass balance accounting method and will be used to develop a water supply reliability report.

The group noted the following:

- CalSim considers the influence of flood operations at Pine Flat Reservoir and the Kings River on operations at Mendota Dam. These influences are not explicitly coded within CalSim, but have been pre-calculated and are simulated as a monthly inflow time series at Mendota Dam.
- There is some opposition to restoration in Fresno and Madera Counties. Delta recapture is a dynamic situation, and that while there will be a better sense of the long-term opportunities for recapture after 2010, predicting future recapture volumes will be challenging.
- The programmatic environmental document (PEIS/R) will include bookend volumes that consider groundwater and regional crop economics.

Temperature Modeling (MWH)

Bill Smith presented on the temperature model HEC 5Q. The model works by taking the computed temp profile in Millerton Lake from a CE-QUAL, which is used to compute release temps, which are then routed through the San Joaquin River. Major conclusions from the temperature modeling are that ambient conditions are important, flow is more effective in maintaining cooler water temperatures than release temperatures, equilibrium temperature is relatively independent from the flow, and equilibrium temperature is usually attained in Reach 5 during spring.

The group noted the following:

- It was asked if a study that investigates whether gains could be achieved on re-operation of the upper basin would be included, and what role “dead storage” or storage below the level required for canal operations, would play concerning water availability. It was indicated that upstream re-operation was not evaluated and that use of dead storage is not being taken into account.
- There was some modeling done on the issue of flows reaching the Merced River, but the temperature change was minimal since the temperatures between the San Joaquin and Merced Rivers near their confluence are similar and related more to ambient temperatures.
- It was asked what triggers the delivery of flood flows down the canal. It was indicated that the diversions are intended to understand the daily downstream delivery, and that they are taken from the CALSIM model.

- This temperature model is compatible with the Lower San Joaquin model developed by Don Smith from RMA.
- Temperatures for the Kings Bypass are based on historic numbers.
- The model does not address high groundwater and its effects on temperature; they are implicitly addressed in the calibration but the model cannot directly evaluate the effects of changes in groundwater influences.

Flood Hydraulics Modeling (TetraTech)

Bob Mussetter presented on UNET Modeling for Flood Damage Analysis. UNET models one dimensional unsteady flow through a full network of open channels. The model indicated that physical changes stemming from the SJRRP would not have a significant impact on the volume of flow, but rather on the water surface elevation. The flows can be input into the model to develop potential levee failure data and stage-frequency curves. These curves were provided to MWH for use in the Flood Damage Analysis to help develop a better understanding of the implications on future flood damages. .

The group noted the following:

- It was indicated that storm hydrographs are taken from the HEC-5 model and are intended to simulate effects from a particular storm on flood damage potential.
- The difference between the finite and infinite scenarios for the model is that the finite scenario allows the levee to fail and the overflow to go to a water storage area, while the infinite scenario confines the flow within the levees and gives the highest possible water-surface for the modeled storm.

Sediment Transport Modeling (Reclamation TSC, Denver)

Blair Greimann presented on the sediment transport models SRH-1D and SRH-2D, noting that the objectives are to assess the impact of project alternatives on the sediment transport in the San Joaquin River from Friant Dam to the Merced River and to support channel and floodplain design efforts. Sediment monitoring has included pebble counts, volumetric sampling, and photo counts. Summary findings include:

- In Reach 1, the SJRRP is likely to reduce the period of time that the flows are above 2,000 cfs, but the bed will remain stable with or without the SJRRP.
- In Reach 2, slightly more erosion is predicted in Reach 2A with the SJRRP (global).
- In Reaches 3 and 4A, a relatively stable increase in erosion is possible.
- In Reach 4B1, slight deposition in the upstream portion of the river is possible if the maximum flow is 475 cfs, and erosion is likely throughout reach if the maximum flow is 4,500 cfs.
- Reaches 4B2 and 5 will continue to degrade with or without the Program.
- The Eastside Bypass will continue to degrade with or without the Program.

The group noted the following:

- Deposition at the Chowchilla Bypass has not yet been modeled, but diversion into the San Joaquin River and its effect on deposition is being considered.

Vegetation Modeling (Reclamation TSC, Denver)

Lisa Fotherby presented on the SRH-1DV model, which links physical and ecological processes

to management actions. The vegetation studies are intended to predict vegetation response to changes in flow management and subsequent impacts to hydraulic capacity, regeneration of the native cottonwood/willow population, and spreading of invasive species. Vegetation modeling could also be used to aid in vegetation-related fisheries studies. Initial results from modeling indicate an average 40-45 percent increase in native riparian vegetative growth between baseline conditions and Alternative A flow regimes, and a 15 to 20 percent increase in invasive riparian coverage. These values vary by reach from no change to a doubling in vegetative cover. Results are preliminary and may adjust with continued verification and reach-based studies.

The group noted the following:

- Vegetation studies in the PEIS/R focus on a comparison of alternatives and will not address the ideal recruitment flow level
- CALSIM flows were used for vegetation analysis modeling, but flows could be further tailored in the future.
- It was asked whether vegetation analysis would be conducted for additional reaches. Additional analysis of Reach 4B1 is planned to aid design. Additional analysis at other locations is not planned at this point, but could be possible in the future.
- Stillwater and Jones & Stokes conducted vegetation monitoring at cross-sections during vegetation flows between 2000 and 2002. Data from those efforts can be used for verification studies.
- The Riparian Objectives Report (2003) should be taken into consideration.
- For scouring, it would be helpful to know which assumptions are being used. Flow requirements between fish and vegetation should be identified, since they are not the same. [Vegetation scour requirements in PEIS studies are listed in Appendix N, Attachment 6].

Groundwater Modeling (USGS)

Steve Phillips presented on the USGS Central Valley Hydrologic Model (CVHM) and how it will be used to evaluate the SJRRP's effects on groundwater conditions. The CVHM will be used to help guide groundwater monitoring, predict the effects on groundwater levels under various conditions, test the effectiveness of potential actions for avoiding impacts, and to help quantify seepage losses and distribution.

Much of the data compilation and analyses required for evaluation and re-calibration of CVHM to local hydrology has been completed. These data include water levels from wells within the Restoration Area and associated well construction information, surface-water flow and stage, and land use. Stage-discharge relationships, which will be used to constrain surface-water flow in the CVHM, have been estimating using the HEC-RAS model developed by Bob Mussetter for the SJRRP.

Additional sediment texture data will be compiled and analyzed to support spatial refinement of the CVHM, which is required to address some of the objectives. The CVHM currently makes use of sediment texture data derived from a small subset of available drillers' logs within the Restoration Area. Additional drillers' logs of appropriate quality will be added to an existing texture database. Higher-quality data from continuous cores collected during installation of SJRRP monitoring wells also will be added to the database. Sediment texture data extracted from

this database will be used to constrain a three-dimensional texture model using geostatistical methods, resulting in a greatly improved and refined representation of the aquifer materials.

The CVHM grid will be refined laterally and vertically to better represent textural variability, particularly within the upper 50 feet of the aquifer system, which in places is characterized by thin deposits of clay and silt overlying sand. Accurate representation of the shallow fine-grained deposits is important for simulation of drainage problem areas and associated effects of Restoration Flows on the water table in these areas.

Spatial refinement of the CVHM grid, which currently is 1 mile laterally and a minimum of 50 ft vertically, is necessary for addressing local-scale questions. This will be accomplished using software that allows for a finer-gridded “child” model to nest within a coarse-gridded “parent” model (the CVHM in this case). The models will run simultaneously, allowing for (1) reasonable hydrologic boundary conditions for the child model, and (2) changes in these boundary conditions caused by natural and anthropogenic changes outside of the child model. Two levels of refinement are currently planned: an intermediate level to address Restoration-Area-scale questions, and a high level to address near-river questions.

Simulations using CVHM will begin during the first quarter of 2010.

The group noted the following:

- Significant vertical refinement was considered. Vertical refinement within the SJRRP area likely will be on the order of 10 feet.
- This modeling will be included in the site specific analysis.

2D Hydraulics Modeling (DWR)

Karim Abulaban presented on the 2D hydraulics model SRH-2D, noting that the model is intended to provide input for habitat elevation, flow patterns, and flood analysis. Objectives include producing high resolution hydraulic information for aquatic-riparian habitat conditions, and to improve understanding of levee capacities and potential improvements to design.

The group noted the following:

- It was asked whether DWR would use cross-sectional results to recalculate numbers for some reaches. It was indicated that DWR can compare the measurements with the model results, and that the comparison would indicate where modifications were needed. This will give DWR an indication on how the model is doing.
- The 1D model was used to calibrate Reach 2B.

Fisheries Modeling (US Fish & Wildlife Service)

Shannon Brewer presented on the Ecosystem Diagnosis and Treatment (EDT) modeling, noting that the model will be used by the Fisheries Management Work Group. EDT includes a multi-stage Beverton-Holt production model and is based on rules created to describe habitat needs of special interest. The next steps in the modeling process are to complete the baseline model, identify a list of alternatives to evaluate using EDT, and identify data gaps that will need to be filled to evaluate alternatives. EDT will eventually be used to evaluate restoration alternatives

from a fisheries perspective (e.g., the spatial extent of floodplains and impact on the fishery).

The group noted the following:

- It was asked whether assumptions for support of the fall run were valid for the spring run as well (i.e. whether these unique experiences were being taken into account). The group will continue to use a fixed survival rate of 3 percent until a Delta model is developed which can provide additional information.

Program Update

Dave Mooney reported that the next public meeting would be held in January, dates to be determined. The purpose of the meeting will be to introduce the PEIS/R alternatives and discuss the results of the impact assessments in the PEIS/R.