# NOTES | August 18, 2011

## Mono Basin Core Working Group Meeting

Prepared by Center for Collaborative Policy

*Core Working Group approved 10/3/2011*

## Meeting in Brief

The Modeling Work Group presented the Core Working Group a "base case" scenario with three alternatives to evaluate achieving Stream Ecosystem Flows (SEFs) under current infrastructure. Preliminary modeling of the SEFs and Grant Lake storage operations reveals that achieving SEF peak flow compliance is very difficult with existing facilities. Inflow remains a key constraint. Keeping Grant high to spill in wetter years and to achieve summertime storage thresholds limits the ability to draw it down and fully utilize storage. Factors that affect management options include changes in temperature and impacts to dam safety. The model has not been refined to make it operationally 'realistic', and in practice there will be additional room for operational adjustments and adaptive management. The Modeling Work Group will run three alternatives for Scenario 2, a theoretical expanded outlet, to present to the Core Working Group at the next meeting.

## Next Meeting: August 23, 2011, 9:00-3:00 p.m. in Bishop

**Topics:** Scenario 1 Base Case SEFs with Existing Facilities; Grant Lake Infrastructure; Scenario 2 Alternatives; Winter Flow Variance and Avoiding Spill; Monitoring Work Group Presentation; Stream Flow and Other Proposed Work Groups; Action Items and Meeting Notes (June 28 and July 13-14); Charter

## Action Items

| Timeframe | | Action Items |
|---|---|---|
| 7/1 | Schlafmann | Take high resolution photos of high flow conditions of SCE flows in Mono Basin (in particular, riffles and low-lying flats) and share with group |
| underway | All | Have legal counsel review eStream licensing agreement and sign. As needed, convene legal team to discuss areas of concern. |
| done | Bartlett | Revise text on Fisheries Monitoring to incorporate group edits |
| done | Parmenter & Coufal | Attorney input to Charter |
| 8/1 | Trush | For Special Conditions for Lee Vining, investigate ramping issues:<br>- whether ramping rates need to be specified under both scenarios (run-off events as well as 5-Siphon Bypass)<br>- ramping the diversion<br>- early emergent fry |
| 8/14 | Vorster & E. Tillemans | Determine availability of usable dataset for 1976-1979; if usable, run data. |
| 8/15 | Modeling Work Group | Determine: potential to bring back to an 8-year event (Synthesis Report, p. 78); modeling approaches for Parker/Water diversions (under the 98-05 rules) |
| 8/23 | Moges | Check with Greg Brown to determine if SWRCB open to variance for fall flows |
| done | Tanaka | Run three alternatives for Scenario 2 to present to Core Working Group: |

| | | |
|---|---|---|
| | E. Tillemans | - minimum SS threshold<br>- hybrid<br>- Charlie (outlet) |
| 9/1 | Schlafmann<br>Parmenter<br>Vorster<br>Trush | Determine that SCE 40cfs flows on Lee Vining contributes significantly to hitting flows for 1-week period on Lee Vining diversion table (possibilities are to develop a spreadsheet) before asking SCE to change operations formally |
| 9/1 | Moges &<br>Reis | Define parameters of what to model for SCE operations |
| 9/1 | Martin | Work with Operations to provide enforceable language for Special Conditions to Lee Vining Creek (per SWRCB request) |
| 9/22 | Martin | Review last year's temperature data regarding possibility of lowering Grant Lake level (absent temperature considerations) |
| 9/22 | E. Tillemans | Get data on 1995-2001 (when Grant Lake did not go below spill for six consecutive years) to determine impact on dam and dam safety |
| soon | E. Tillemans | Include in data presentation tables an analysis of compliance for peak flow (as done for storage over 29 year period) |
| soon | Tanaka | Add Stream Scientist recommendations to data presentation graphs for comparison to alternatives (via note or additional line on graph, etc.) |
| 9/22 | Bartlett<br>Moges | Investigate file-sharing website to house group documents and calendars |
| 10/3 | Coufal | Report back on seepage and minimal freeboard issues on MGORD (#9) |

## Modeling Scenario 1: Base Case

The Modeling Work Group identified three alternatives for Scenario 1, Base Case, to identify management options under the current operating infrastructure. All alternatives operate under the same parameters:

- modeling period from April 1, 1980, to 2008,
- starting elevation of 6,410 feet for Mono Lake, and
- export prohibited between June 1 and July 31 during wetter year-types (Wet-Normal, Wet, and Extremely Wet).

Grant Lake's starting storage was 27,000 acre-feet (af) and its maximum capacity set at 47,171 af. The capacity of the Return Ditch as well as of the Grant Lake Withdrawal Structure was 380 cfs. For these preliminary results, the Modeling Work Group did not consider exports or Mono Lake level. The three alternative rule sets were:

1. **Minimum** – Operating rules developed from the minimum thresholds provided in the Synthesis Report. The minimum thresholds are not recommendations or targets; they are absolute minimums that the Stream Scientists provided as guidance for LADWP to develop operating rules. They include abrupt storage change requirements that the Core Working Group has agreed are unrealistic.

2. **Hybrid** – Operating rules based on the 98-05 Order. Under the Hybrid alternative, Grant Lake Storage starts out lower in drier year-types. Wetter year-types start out higher and ramp up to

capacity to reach spill during the desired period (Jun 1 – Jul 31), after which Grant Lake Storage drops sharply to 20,000af, allowing export to start.

3. **Reis** – Operating rules developed by Greg Reis of the Mono Lake Committee. Under this rule set, Grant Lake Storage starts out a different level according to each specific year-type, and there are higher storage requirements throughout the year. The intention of this rule set is to achieve compliance with the Synthesis Report recommendations.

In comparing Grant Lake Storage levels under each alternative, the Minimum was eliminated as a practical option due to its inability to reach spill. According to the modeling results, the Reis rules would result in higher peak flows during shorter periods of time, whereas the Hybrid rules would result in slower, more consistent flows. In comparing Rush Creek SEFs among the two remaining viable alternatives, the Reis rules were able to reach capacity more often than the Hybrid rules, although neither came close to reaching target SEFs during wet year-types. The Modeling Work Group noted that peak inflows may not correspond to timing of peak releases.

The models show that reaching the Synthesis Report recommended SEFs and/or increasing spill will require securing additional inflow (e.g. through coordination with SCE or USFS) or upgrading LADWP facilities. Other opportunities for coordination exist, including coordination with peak flows on Walker and Parker Creeks. Due to miscellaneous losses and evaporation, the amount of inflow needed will have to be higher than the required targets. The group remains committed to identifying specific flow needs to present to SCE.

In assessing spill under both alternatives (utilizing the same parameters), neither was able to meet any of the required spill targets. Spill overage was significantly higher under Reis (111,469 af) than under Hybrid (74,692 af). Storage was much higher under Reis as well; see following table for comparison. In normal year-types, Reis consistently met Summer Storage requirements, while Hybrid was below required levels from July 1 – Dec 1; exports were only available under Hybrid. Both alternatives met required levels during wet year-types.

| **STORAGE (over 29 year period)** | **Hybrid** | **Reis** |
|---|---|---|
| Total Days Below 11,500 af | 0 (0%) | 0 (0%) |
| Total Days Below 20,000 af (Jul 1- Sep 30) | 1135 (43%) | 0 (0%) |
| Total Days Below Spill (in WN, W, EW years: Jun 15-Jul15) | (25%) | 105 (1%) |
| Total Days Below Synthesis Report Minimum Storage Levels | 1334 (13%) | 105 (1%) |

## Preliminary Modeling Work Group Observations

**SEF Peak Flow Compliance** - Under existing facilities, achieving peak flow compliance in wetter years is very difficult and limited by inflows to Grant Lake Reservoir. Adjusting the timing of outflows to maximize peaks is limited by the ability to forecast inflows. While there is the potential to increase outflows with coincident spills and ramping, this amount is minimal (10% at best).

**20,000 af in Grant During Summer** - Keeping Grant above 20,000af in the summer period for outflow temperature maintenance could be challenging in selected years unless storage targets are kept high. A drop below 20,000 af could be significant during runoff years at the drier (lower) end of year-types, particularly normal year-types, with high SEF peaks in June/July; e.g. 1985 and 2003. A drop below 20,000af is relatively small in drier years if inflow is much less than outflow.

**Overall Storage Insights**

- Keeping Grant high to spill in wetter years and to achieve summertime targets limits the ability to draw it down and fully utilize storage for exports.
- Spills occur in times outside of required spill times, where it may not be beneficial to the ecosystem.
- Keeping Grant Lake full for extended periods of time raises concerns about facility safety, including fracture and saturation issues. If Grant Lake were operated closer to spill, LADWP would have to monitor it much more closely to ensure rapid response to any problems.

The model has not been refined to make it operationally "realistic". It shows a strict interpretation of the rules and timing even though the recommendations allow for some flexibility in timing. In practice, operational adjustments and adaptive management are possible that the model does not capture; one example is adjusting flows slightly earlier in earlier runoff years.

LADWP emphasized that it cannot achieve SEF flows with existing facilities. While operational adjustments offer room for some improvement, they are unlikely to be sufficient to make a difference without additional inflow. One constraint to adaptive management is LADWP's need to coordinate flows within the greater context of Los Angeles Aqueduct operations.

The Core Working Group will need to agree on trade-offs regarding spills and Grant Lake storage levels. Factors that affect management options include changes in temperature that result from lowering Grant Lake levels and impacts to dam safety of keeping Grant Lake full for extended periods. The relationship between spill and the lake levels and export will impact the solutions available to the Core Working Group. Future modeling analyses will change the Mono Lake starting level to 6,391 once scenarios begin considering Mono Lake levels and exports.

## Next Steps

- The Modeling Work Group will run three alternatives for Scenario 2 to present to the Core Working Group: minimum Stream Scientist threshold; hybrid; and a modified (expanded) Grant Lake outlet and 750cfs in Reach 1 ('Charlie's Rules'). This will yield two comparisons: Scenario 1 and Scenario 2. Modeling will display Stream Scientist recommendations for reference and add compliance metric for peak flow. Scenario 2 alternatives will present different ways to manage Grant Lake Reservoir in order to achieve SEF recommendations.

| Scenario 1, Base Case SEFs with Existing Facilities | Outputs |
|---|---|
| - Alternative | Grant Lake Reservoir Storage |
| - Alternative | |
| | Mono Lake Levels |

| | |
|---|---|
| Scenario 2, Expanded Outlet | Exports |
| - Alternative | |
| - Alternative | |

- LADWP will review last year's temperature data regarding the possibility of lowering Grant Lake level (absent temperature considerations)
- LADWP will get data on 1995-2001 (when Grant Lake did not go below spill for six consecutive years) to determine impact on dam and dam safety

## Attendance

**IN PERSON**

*Meeting Participants*
Gene Coufal, Los Angeles Department of Water and Power (LADWP)
Lisa Cutting, Mono Lake Committee (MLC)
Mark Drew, California Trout
Ali Karimi, LADWP
Dave Martin, LADWP
Geoff McQuilkin, MLC
Bruk Moges, LADWP
Steve Parmenter, DFG
Paul Pau, LADWP
Stacy Tanaka, Watercourse
Eric Tillemans, LADWP
Jennifer Wong, LADWP

**BY PHONE**
Mike Deas, Watercourse
Ross Taylor, Ross Taylor & Associates
Peter Vorster, MLC

*Facilitation*
Facilitator Gina Bartlett, Center for Collaborative Policy (CCP)
Note-taker Hannah Murray (CCP)