



BARBIE MILLER

12 Years and counting: Mono Basin restoration progress report

by Lisa Cutting

It has been twelve years since the California State Water Resources Control Board's precedent setting Decision 1631 (D1631), which limits Mono Lake water diversions by the Los Angeles Department of Water and Power (DWP). Included in the State Water Board's renowned decision was a mandate for DWP to develop and implement restoration plans in order to repair over 50 years of damage caused by excessive water diversions.

The restoration plans were formally adopted in 1998 when the Water Board issued Orders 98-05 and 98-07. These two orders identified specific physical actions and monitoring required of DWP to fulfill its restoration obligation in the Mono Basin. While some interim restoration activities had already taken place prior to D1631 and Orders 98-05 and 98-07, the majority of the restoration work began in 1998.

What is restoration?

The scientists who developed the Mono Basin restoration plans relied upon the dictionary definition of the word restore: to bring back into existence or use; to bring back to an original state. Restoration activities approved by the State Water Board in 1998 focus on re-establishing natural processes and historic conditions, rather than specific former landscapes. Because several important former land features are irrecoverable and some processes need a helping hand, the Water Board also ordered certain activities, such as planting trees, opening formerly plugged stream channels, and instituting an interagency prescribed burn program in lake-fringing areas.

The goal of the restoration plans is to reestablish the habitat conditions and ecological processes that will enable the lake and the streams to essentially restore themselves over time. Even though the primary emphasis is on restoring natural processes to the greatest extent possible, it should be noted that some damaged areas will never be fully restored.

Prediversion conditions

Before the turn of the century, all water in the Mono Basin watershed flowed into Mono Lake. Millions of migratory waterbirds depended on the lake's unique ecosystem, teeming with brine shrimp and alkali flies, and on its associated mix of habitat types, including islands, protected lagoons and lake-fringing springs and wetlands. The inlet mouths of the streams, where the fresh water mixed with the lake's briny water, provided particularly productive environments where birds could rest, bathe, and feed.

Upslope of the lake, Mono's tributary streams descend from the Sierra Crest through the arid Great Basin landscape, supporting lush bottomlands in the stream floodplain. These "wooded wetlands" featured multistoried cottonwood forests, deep meandering multiple stream channels, backwater ponds, and wet meadows.

Damage caused by excessive water diversions

In 1941, DWP began diverting four of Mono Lake's five tributary streams for urban water use for the city of Los

Continued on page 5

Angeles. By 1990, Mono Lake had dropped 45 vertical feet, doubled in salinity, and lost a number of freshwater habitats, such as delta marshes and brackish lagoons that formerly provided habitat for millions of waterbirds. Tributary streams dried up and lost stabilizing streamside vegetation. Periodic floods in high runoff years degraded the stream channels and caused downcutting and channel abandonment, which lowered the water table. In turn the lush cottonwood forests in the stream's floodplain died. The Mono Basin lost a premier fishery on Rush Creek as well as over 90 percent of its former populations of ducks and geese.

Water Board decision

In 1994—after a lengthy series of court battles and public outcry—the California State Water Resources Control Board issued Decision 1631, which set a target lake level for Mono Lake, established minimum flows and annual peak flows that DWP must deliver to the creeks, and ordered DWP to develop restoration plans for the streams and waterfowl habitat. The restoration plans were formally adopted in 1998 and set a course that DWP would follow in working to undo some of the damage caused by excessive diversions.

Hydrologic models developed at the time of the decision predicted that the lake could reach its target level established by the State Water Board by 2014. Because water will continue to be diverted to Los Angeles, the Mono Basin will not ever be completely restored to its original state. Mono Lake will still be 25 feet lower than its prediversion level, the streams will carry less flow than they once did, and former cottonwood-willow riparian forests will still be maturing. Climate variability, including locally documented climate change, could increase the amount of time it will take to reach the target lake level.

Mono Lake restoration

D1631 set the rules for restoring Mono Lake to a healthy level. The target lake level set by the State Water Board is 6391 feet above sea level. This target represents a level at which Mono Lake's ecosystem—alkali fly, brine shrimp, and California Gull populations—will be stable and at which shallow flooding will significantly reduce the toxic dust storms on the eastern shore of the lake. Future wet and dry years will cause the lake to fluctuate around the target level.

Stream restoration

The stream restoration plan focuses primarily on restoring habitat by maintaining flows that mimic the pattern of former natural flows—but not the magnitude or duration of former flows, since some water is still being diverted to Los Angeles. A key component of the hydrograph, the record of flow in the stream over time, is the specified peak flows—called stream restoration flows. In the spring and early summer runoff season stream restoration flows help create habitat through erosion and deposition.

Other stream related restoration activities include:

- Reopening certain side channels in stream floodplains

in order to distribute water to raise groundwater levels and allow riparian vegetation to spread out and become self sustaining.

- Rehabilitating the Rush Creek Return Ditch, which allows for restoration flows to be conveyed to Rush Creek.
- Prohibiting livestock grazing within the riparian corridor on DWP land to allow vegetation to reestablish along the creeks.
- Restoring riparian vegetation to pre-diversion acreage amounts, which will ensure that habitat complexity is established and self-sustaining.
- Evaluating and implementing ways to pass sediment down the creeks below the diversion structures will provide fine gravels for fish habitat and seed beds for new vegetation.
- Limiting vehicle access in sensitive areas near the streams allows vegetation to spread out from the creek edges.
- Removing invasive tamarisk along lower Rush Creek. Tamarisk is an introduced, invasive plant that out-competes native species.
- Placing large, woody debris in the creeks, which helps create habitat complexity in the creeks by creating cover for fish and providing habitat for invertebrates.

Waterfowl habitat restoration

The single most important action identified for restoring waterfowl habitat was to raise the level of Mono Lake, in order to recreate shoreline habitat. The Water Board also ordered DWP to implement a controlled burn program with the goal of reestablishing open water areas at springs around the shores of Mono Lake that have been identified as essential waterfowl habitat. It should be noted that in 2003 the State Water Board decided to suspend the required waterfowl habitat

Continued on page 6



The Rush Creek return ditch transports water from Grant Reservoir to Rush Creek.

prescribed burn program until the lake reaches its management level at which time the burn program will be reevaluated.

What restoration activities have been completed?

Some of the activities, especially monitoring, are ongoing. Others have been completed, and others are yet to be done. The following requirements are examples of restoration activities that DWP has completed:

- The Rush Creek Return Ditch was rehabilitated in 2002, tested in 2004, and can now operate at its full capacity—380 cubic feet per second (cfs). This allows for dry and normal year stream restoration flows to be reliably conveyed to Rush Creek. Wetter year stream restoration flows require augmentation from Lee Vining Creek or spills over Grant Lake Reservoir.
- DWP has physically reopened side channels on Rush Creek. Other side channels remain on the list and scientists are currently evaluating potential benefits against any impacts associated with the mechanical intrusion required to open a channel.
- DWP improved the Lee Vining Creek diversion dam in 2004 with a sediment bypass facility that helps insure the appropriate flows are delivered downstream. Walker and Parker Creek sediment bypass evaluation is ongoing.
- Large, woody debris has been placed in the creeks in order to provide habitat complexity.
- Dirt roads that previously existed in stream floodplains have been closed to vehicle access.



The upgraded Lee Vining Creek sediment bypass facility no longer blocks sediment needed for fish habitat and new vegetation, but allows it to pass downstream.

Ongoing monitoring

DWP conducts annual monitoring of restoration progress in order to chart its course to successfully fulfilling its requirements under the Water Board orders for restoration. Every year a comprehensive compliance report summarizing restoration activities and detailing the scientific monitoring results is produced by DWP and submitted to the State Water Board and other interested parties. The monitoring includes actions such as:

- Lake level measurements

Continued on page 7

The role of adaptive management in restoration

Adaptive management is an approach used to address uncertainties by viewing management actions as experiments derived from hypothesis, conducting extensive monitoring, evaluating the results, and then determining if the management and underlying assumptions need to be changed accordingly.

Stream restoration flows (SRFs)—high flows due to snow melt in the spring—are a good example of how adaptive management works on the ground. The magnitude, duration, and frequency of the SRFs and the physical actions specified by the Water Board orders were based upon educated “guesses” by stream scientists of what was needed for restoration. Because of the uncertainty associated with some of the restoration recommendations, especially the SRFs in wetter years and the ability of DWP to reliably deliver them, the Water Board approved the adaptive management process that the parties developed through the legal settlement.

The Water Board specifically ordered the “stream monitoring shall evaluate and make recommendations, based upon the results of the monitoring program, regarding the magnitude, duration, and frequency of the SRFs necessary for the restoration of Rush Creek; and the need for a Grant Lake bypass to reliably achieve the flows needed for restoration of Rush Creek.”

Presently, Grant Lake does not have an outlet for reliably delivering the recommended SRFs in the wetter years. However the Committee has agreed to a test period of monitoring the streams and evaluating alternative approaches to delivering the SRFs to Rush Creek, including augmenting Rush Creek peak flows with Lee Vining Creek diversions. The final SRFs have not been determined and will require the scientists to collect additional data before making a final recommendation. This recommendation will ultimately influence whether or not a Grant Lake Reservoir outlet is needed.

- Vegetation studies at key sites around the lake
- Aerial photography of the streams and lakeshore
- Geomorphic monitoring of stream channels
- Vegetation mapping of entire stream corridors
- Fish population studies
- Waterfowl surveys

What still needs to be done?

Decision 1631 and the restoration orders lay out a specific road map for DWP and the scientists to follow in order to satisfy the various restoration requirements. Although the orders are quite clear in some areas (minimum stream flows, peak flow amounts, etc.) some areas aren't as clear, especially when the process of adaptive management (see box on page 6) is being followed.

In 2004, ten years after the State Water Board decision, Committee staff and consultants began compiling a restoration matrix in order to track all the restoration requirements and to establish the status of each one as either complete, incomplete, in progress, or deferred. In the summer of 2005, the Mono Lake Committee and DWP representatives spent two full days in the field verifying how we had categorized each item. The group looked at matrix items such as revegetation of specified locations, opening of stream channels, and closing of roads in the stream floodplains.

Both the Committee and DWP have been refining this document and the status report is nearing completion. Once completed, it will be submitted to the State Water Board in order to show the restoration progress that has been made, the activities that still need to be completed, and to alert the Water Board to potential disagreements that may need intervention. This report will serve as a valuable tool in guiding restoration activities this coming year and in future years.

When is restoration "done"?

In some ways, the Mono Basin restoration as envisioned by the Water Board and scientists will not be "done" in our lifetimes. At the time of the decision, it was estimated that it would take 20 or more years for Mono Lake to rise to its target level of 6391 feet. The streams will take even longer to fully recuperate. While riparian vegetation is coming back along the formerly dry channels, the cottonwood seedlings along the stream banks will take 50 years to mature. Rebuilding the floodplain and stabilizing channels will take decades.

Although restoration will take a long time, DWP's obligations under the Water Board order may be satisfied much sooner. The restoration orders specify certain "termination criteria" which are essentially stated endpoints that the stream restoration actions are focused on achieving. Once these requirements are fulfilled to the Water Board's satisfaction DWP will be relieved of its detailed monitoring obligations.

How is the Committee involved?

The Committee and its dedicated consultants continue to work closely with DWP in the ongoing restoration process.

The Committee is the "watchdog" for restoration, using its presence in the Mono Basin to stay on top of what is happening and to provide input and feedback to DWP and the stream scientists.

For example, Mono Lake Committee staff and consultants attend bi-annual restoration meetings that DWP convenes to report on their restoration and monitoring activities and to describe their plans for the upcoming year. These meetings include representatives from DWP, the State Water Board, and other interested parties that were involved with the original court proceedings.

After these meetings, the work is far from over. The Committee cross-checks data and decisions every step of the way, ensuring that DWP's information is correct and more importantly, that actions adhere to the State Water Board order. Routine examples of the Committee's work in this area include tasks such as analyzing stream hydrographs; determining when the "peak" will occur—another critical timing element dependent on temperatures and available snow pack; and monitoring daily aqueduct reports to make sure the creeks are receiving the minimum flow of water required.



Committee staff record piezometer readings, measuring groundwater levels at key points around the Basin.

Because the parties are operating under an adaptive management strategy, there are often times when the scientists want to gather additional data or test hypotheses and this may require deviation from the order and therefore approval from the State Water Board. The Committee works with the scientists to achieve an understanding of their goals and associated rationale for the exception. The Committee makes every attempt to approach these requests in a balanced way—often times straddling the line between the quest for additional information and still conforming to the intent of the order.

Continued on page 8

How is the working relationship with DWP?

The Committee and the DWP mutually agreed to accept the Water Board decision as the resolution of the decades-long water diversion controversy, and both have oriented on good-faith implementation of that decision. A good relationship has been established while pursuing these restoration objectives because we are working within a well-defined process that allows for discussion, dispute, and resolution of debates. While there certainly are disagreements, there is also commitment from both sides to work together and to resolve issues internally whenever possible. As a last resort, if resolution between the Committee and DWP is not possible, either party has the ability to request a ruling from the State Water Board.

It is clear that the Mono Lake Committee's ongoing and permanent presence has continued to improve the protection and restoration of Mono Lake and its tributary streams. As a result of these efforts, Mono Lake is now a recognized icon of how it is possible to find win-win solutions to save a special place. Today, Mono Lake and its streams are in the process of healing, showing how it is possible to restore an entire watershed that had been significantly degraded. ❖

Lisa Cutting is the Committee's Eastern Sierra Policy Director. With spring in the air, she's ready to hang up her skis and get out her fly rod.

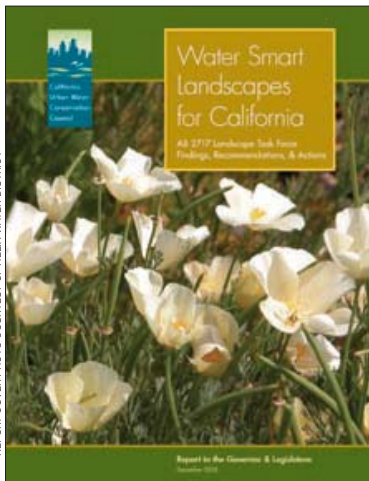
Meeting with DWP Commissioners

On January 31, the new DWP commissioners hosted a workshop on Eastern Sierra issues at their regular meeting. Mono Lake Committee staff presented an overview and status report on Mono Lake restoration and the Committee's youth education program.

The restoration status report included a review of the history of the Mono Lake water diversion controversy and outlined the solutions now being implemented. Committee staff discussed the status of DWP's Mono Lake obligations, including stream restoration, lake restoration, and aqueduct facilities management. Discussion with the commissioners provided the opportunity to underscore the win-win solutions that have been found at Mono Lake, where the water needed to protect Mono Lake has been replaced through conservation and reclamation in Los Angeles. For more information on the DWP commissioners meeting see page 9.

The Committee is looking forward to working with the new DWP commissioners to assure that Mono Lake restoration continues to be successful and to pursue new initiatives that benefit the Eastern Sierra.

Water-smart landscapes for California



REPORT COVER PHOTO COURTESY OF HELIX WATER DISTRICT

The Task Force's recommendations to the Governor and legislature for water-conserving landscapes in California.

What is one of the most cost-effective ways every Californian can help protect Mono Lake and other natural areas that must share water with agricultural and urban areas now and in the future? Turn home gardens and city and business landscapes into beautiful "water-smart" places without high water demands.

The Landscape Task Force was charged by the legislature to evaluate and recommend proposals for improving the efficiency of water use in new and existing urban landscapes in California. The Task Force, lead by Ron Munds, City of San Luis Obispo, and vice-chaired by David Zoldoske, President of the Irrigation Association and Frances Spivy-Weber, Mono Lake Committee Executive Director for Policy, published its recommendations

in December 2005. When these recommendations are implemented, Californians will save 600,000 to 1 million acre-feet of water per year—enough to meet the needs of up to two million households for a year without further damaging ecosystems through water diversions.

The top five recommendations are:

1. Adopt water conserving rate structures. Water consumers should get a price signal when they are using too much water.
2. Reduce the state's recommended landscape water budget and review the budget every ten years. New technology and new research will make gardening more water efficient.
3. Enforce and monitor compliance with local ordinances. Are you familiar with your community's rules?
4. Require dedicated landscape meters. It is hard to know how much water you are using on the landscape if you have a meter than combines indoor and outdoor use.
5. Promote the use of recycled water in urban landscapes. Recycled water is a drought-proof, reliable source of water and it saves potable water for human consumption.

For more the full recommendations, go to www.cuwcc.org or contact Fran (frances@monolake.org) at (310) 416-0041.