

Science and Management Partner to Restore Streams & Meadows in Lake Tahoe

Stream and meadow habitats are critically important to native animal and plant species and provide natural water filtration and flood protection for local communities. Unfortunately, these habitats have been degraded due to development, fire suppression, and other land use practices. Approximately half of the meadow habitat in the Tahoe Basin has been permanently lost, fragmented, or altered.

Key Management Questions

Restoration and enhancement of stream and meadow habitats has been a priority for environmental managers for more than two decades. Despite these efforts long-term, self-sustaining restoration remains a challenge. Key management questions include:

- What is the condition of our stream and meadow habitats throughout the basin, and how is their condition changing over time?
- Have past restoration efforts been effective in rebuilding stream and meadow habitats and enhancing water quality?
- What impact have restoration efforts had on reducing the delivery of fine sediment to lake and restoring lake clarity?



Stream-meadow complex, Angora Creek, South Lake Tahoe, CA. Photo Scott Hinton.

Science Investments to Address Key Management Questions

Scientists and agency representatives are working collaboratively to complete several science projects of relevance to management issues:

- Evaluate the applicability of the California's Rapid Assessment Methodology (CRAM) to assess and track the condition of alpine stream habitats found in the Tahoe Basin.
- Develop and test new rapid assessment methods for wet meadow habitats throughout the Sierra Nevada.
- Develop a framework for planning and evaluating the effectiveness of stream restoration projects in the Lake Tahoe Basin.
- Assess how stream and meadow restoration can help improve the clarity of Lake Tahoe and develop methods to predict the amount of fine sediment that can be prevented from reaching the lake as a result of stream and meadow restoration projects.

Key Science Findings

- A new planning and evaluation framework has been developed, tested and validated to quantify the impacts of stream restoration on the environment and local population centers.
- Evaluation of past projects found shortcomings in Tahoe Basin restoration projects consistent with those found in similar areas across the country. These include inconsistent or incomplete project goals, lack of funding for monitoring and reporting,

and monitoring timelines dictated by funding or regulatory constraints rather than ecosystem response times.

- A restoration study on the Upper Truckee River indicated that up to 70 percent of fine sediment contained in streamwater flowing onto a floodplain can be retained on that floodplain, and hence, prevented from reaching the lake.

Management Actions Taken

- Federal, state and local governments have renewed their commitment to enhance and restore stream and meadow habitats in the Tahoe Basin.
- New research has informed the design of stream and meadow restoration projects, including the adoption of a new planning and evaluation framework.
- New methods for long-term monitoring of the health and functionality of stream and meadow habitats are being implemented.
- New models are being used to estimate the benefit to lake clarity from stream and floodplain restoration and inform stream pollution load reduction targets.



Aerial photo of the Upper Truckee marsh at Lake Tahoe. Photo courtesy of the CA Tahoe Conservancy.

Next Steps

Improving the effectiveness of stream and meadow restoration requires close collaboration of scientists and managers to

- Create new decision-support modeling tools that help managers understand and anticipate the impacts of restoration
- Implement rapid assessment methods to quickly evaluate the condition of stream and meadow habitats basin-wide
- Develop efficient monitoring and reporting tools to evaluate and communicate the effects of restoration efforts
- Implement adaptive management methods for future restoration projects that incorporate lessons learned and cost-risk benefit analysis

Where to go for more information

For more information on SNPLMA-funded research projects for the Lake Tahoe Basin go to: www.fs.fed.us/psw/partnerships/tahoescience

For more information about the California Rapid Assessment Methodology (CRAM) go to: cramwetlands.org or Lahontan Regional Water Quality Control Board (530) 542-5400.