South Fork Humboldt Reservoir and Dam, public domain

Nonpoint Source Management Program SFY 2020

Annual Report

NDEP

NEVADA'S NONPOINT SOURCE MANAGEMENT PROGRAM

SUMMARY OF ACCOMPLISHMENTS

This report is written to comply with Subsection 319(h)(11) of the Clean Water Act (CWA), which requires each state to report to the United States Environmental Protection Agency (EPA) on an annual basis regarding (A) its progress in meeting milestones listed in the Nevada Nonpoint Source State Management Plan; and (B) to the extent appropriate information is available, reductions in nonpoint source (NPS) pollution loading and improvements in water quality resulting from implementation of the management program.

The report documents the activities and accomplishments of the Nevada Division of Environmental Protection (NDEP), Nonpoint Source Pollution Management Program (NPS Program) and other state, federal, and local agencies in addressing NPS issues in Nevada. The reporting period for these activities, **July 1, 2019 through June 30, 2020,** coincides with the State Fiscal Year (SFY) 2020. During this time the NPS Program operated under the Federal Fiscal Year (FFY) 2020 work plan and funding (Grant C9-979081-19). Activities referenced, including the preparation of this report, were funded through Subsection 319(h) of the Clean Water Act (CWA) via the EPA. All tasks delineated in this quarterly report support the EPA's Strategic Goal 2: Protecting America's Waters and EPA's Objective 2.2: Protect and Restore Watersheds and Aquatic Ecosystems.

The annual reporting requirements delineated in the *Nonpoint Source Program and Grants Guidelines for States and Territories* (p.45) are listed below with their corresponding location in this report:

REPORTING REQUIREMENT	LOCATION
Summary of progress with evidence/examples toward meeting approved milestones, short and long-term goals and objectives	Summary Appendix C: Project Updates Appendix D: Nevada Success Story
Matrix displaying milestones	Appendix A: Milestone Matrix
Discussion of Federal Agencies supporting SMP milestones	Summary
Summary of NPS load reductions	Summary Appendix B: Load Reductions
Summary of environmental improvements	Appendix C: Project Updates Appendix D: Nevada Success Story

Table 1: EPA Annual Reporting Requirements and Location

Nonpoint Source Pollution in Nevada

The Nevada Nonpoint Source State Management Plan (SMP) establishes how NDEP will work with partners to address NPS pollution from 2015 through 2019. The SMP formalized Nevada's approach for protecting and improving water quality and described the goals, short and long term objectives, milestones and timeframes to guide activities, and measures for tracking success. The SMP incorporates the "Key Components of an Effective State Nonpoint Source Management Program" as identified in the *Nonpoint Source Program and Grants Guidelines for States and Territories* issued by EPA on April 12, 2013. This report discusses activities performed under the Plan from July 1, 2018 through June 30, 2019.

State Management Plan Update

The 2015-2019 Plan was updated and submitted to EPA for review and approval on November 21, 2014. On February 5, 2015, NDEP received EPA approval for the updated 2015-2019 Plan. The 2020-2024 update was submitted September 22, 2020.

Reporting Environmental Progress

NDEP is committed to reporting environmental improvements that result from nonpoint source projects. It is important for incremental progress to be described and reported adequately to tell the story of Nevada's nonpoint source program. A list of environmental indicators was created by NPS staff to adequately demonstrate improvements. These indicators include integrating pre- and post-site conditions through data gathering by establishing photo points, tracking feet of riverbank restored, monitoring increase in riparian vegetation, and evaluating trend in Proper Functioning Condition (PFC), among others. For education programs, success will be evaluated through implementation of a logic model, pre- and post-knowledge statistics, attendance and self-evaluation of likelihood of environmental behavior change, and other metrics as they are determined. All new projects have specific, appropriate indicators written into their project contracts and scopes of work to ensure that all 319(h) projects adequately report environmental improvements. All active projects during SFY 2020 were evaluated with environmental results reported using this template. Care was taken to ensure that relevant metrics were included; as well as information regarding progress, partners, and leveraging of funding. Project updates utilizing the "Telling the Story" framework are included in Appendix C and Nevada's annual Success Story, the accomplishments of One Truckee River, is attached as Appendix D.

Fiscal Summary

Contract funds were obligated through the 2019 Grant Funding Opportunity (GFO) process (in the summer/fall of 2019). Thirteen projects were funded in the amount of $926,334. A portion of remaining contract funding will be rolled over to the SFY 202 GFO process. A Request for Proposals (RFP) was announced in July and closed in September 2019. The awardees were as follows:

Table 1: 2019 319(h) Awards

2019 319(h) Grant Award Recommendations

Implementation Projects		
Proposal Name:	**Entity**	**Award Amount**
Genoa West Fork Carson River Bank Stabilization Phase 1	**Carson Valley Conservation District**	**$100,000.00**
Washoe County Crediting Registration and TMDL Implementation	**Nevada Tahoe Conservation District**	**$36,730.00**
Truckee Meadows Nature Study Area: Phase One	**Truckee Meadows Parks Foundation**	**$30,000.00**
Initiatives to Reduce Non-Point Source Pollution in So. NV	**Southern Nevada Water Authority**	**$39,950.00**
Walker River Riparian Restoration at Pitchfork Phase 1	**Nevada Division of State Parks**	**$100,000.00**
Lower Wood Creek WQ Improvement Project	**Washoe County Community Service Department**	**$200,000.00**
TNC River Fork Ranch Streambank Protection	**The Nature Conservancy**	**$30,541.00**
	Subtotal:	**$537,221.00**
Public Outreach Projects		
Proposal Name:	**Entity**	
Clark County NPS Pollution Outreach and Education Program 2019	**Clark County Water Reclamation District**	**$47,000.00**
Lake Tahoe Source Water Plastic Pollution Outreach	**Incline Village GID/Tahoe Water Suppliers**	**$61,995.00**
River Wranglers Environmental Education Program	**River Wranglers**	**$85,827.00**
Project Wet and Discover a Watershed Teacher Workshops	**Get Outdoors Nevada**	**$18,084.00**
Valuing and Protecting our Tahoe Watershed	**Great Basin Outdoors School**	**$76,209.00**
	Subtotal:	**$289,115.00**
Watershed Planning Projects		
Proposal Name:	**Entity**	
Watershed Management Plan for Truckee River, 2019	**Nevada Land Trust**	**$99,998.00**
	Subtotal:	**$99,998.00**
	Grand Total:	**$926,334.00**

Nonpoint Source Program Accomplishments

Priority 1: Support/Grow Existing Local Watershed Efforts

The NPS Program has established effective long-term relationships with agencies, organizations and the private sector. NDEP strengthened these partnerships for continued implementation of water quality improvement and environmental education projects including:

- Carson Water Subconservancy District for implementation of the Carson River Adaptive Stewardship Plan;
- Douglas County, Washoe County and Nevada Department of Transportation for implementation of the Lake Tahoe TMDL;
- Southern Nevada Water Authority and Las Vegas Wash Coordination Committee for implementation of the Las Vegas Wash Comprehensive Adaptive Management Plan; and

- Conservation Districts including Carson Valley and Dayton Valley for implementation of bank stabilization, riparian habitat restoration and environmental education projects.

The NPS Program continued to build relationships as outlined in the 2015-2019 Plan. Specific information regarding activities is reported below under each watershed, and more detailed information is attached in the Appendix C: Project Updates.

Priority 2: Establish New Partnerships

During SFY 2020, the NPS Program has met with a multitude of agencies to encourage increased leveraging of funding and to accelerate mitigation of NPS pollution throughout the state. Details follow.

NDEP Integrated Source Water Protection Program (ISWPP)/One Truckee River Management Plan

In response to EPA's direction to better coordinate Nonpoint Source Program activities with Source Water Protection, NPS staff met with NDEP's Integrated Source Water Protection Program (ISWPP) to identify areas where the two programs have overlapping goals and where coordination could increase. In SFY 2016, a coordinated action plan was developed and submitted with the Annual Report in September 2016. Through ancillary efforts in developing the water quality component of the One Truckee River (OTR) collaborative effort, NPS and ISWPP staff saw many convergent opportunities to create a joint watershed and source water protection plan in Washoe County and the Truckee River Watershed. In 2017, the 319(h) Technical Advisory Committee recommended an additional $99,780 to partially support a One Truckee River Coordinator, who was hired in April, 2018. In 2018 and 2019, the TAC again funded the OTR Coordinator. In 2019, the TAC awarded monies to the Truckee Meadows Regional Planning Agency to develop a GIS on-line planning tool component for the Plan. The Western Regional Water Commission saw the value in providing local match monies to update the Tributary Plan overseen by the Truckee Meadows Stormwater Permit Coordinating Committee and set aside $75,000 for a data gap analysis and an additional $150,000 for the update of the plan itself. The Tributary Plan update is a main component of the Source Water/Watershed Plan and was approved by the Committee and NDEP in July. Due to needing approval at multiple commission meetings for budget approval and contract approval, the process is now forecast to conclude by the end of 2020. This coordination has been an exciting and groundbreaking collaboration between surface and groundwater programs in Nevada, in addition to local stakeholders, and we expect to continue this kind of coordination in the future for broader-based water planning, protection and restoration in Nevada.

NDEP Abandoned Mine Lands

NPS staff coordinated with the Bureau of Corrective Actions Abandoned Mine Lands (AML) Program. A high priority project with toxic arsenic levels was identified for coordination between programs. The NPS program is coordinating with the AML Program for accelerated implementation of remediation which will lower arsenic levels in 3 Mile Creek in the Quinn River watershed. The remedy was installed and subsequent monitoring is occurring to determine the success of remediating arsenic levels. Post-monitoring continued through SFY 2020 and outcomes are expected to be reportable in SFY 2021.

USFS

The annual USFS/NDEP Coordination meeting was held on April 29, with fourteen attendees via teleconference. The meeting focused on mutual understanding with questions about how to further

collaborate and coordinate water quality planning and implementation efforts. NPS staff compiled contact information and notes and distributed them after the meeting.

NRCS

NPS staff attended and presented at the NRCS State Technical Advisory Committee via teleconference on April 9, 2020. NPS Staff met virtually with NRCS to determine how to revise the selected NWQI HUC-12 watersheds in order to coordinate with the new Source Water Initiative released in the most recent farm bill. Source Water and NPS Program Managers met to determine an area that had producers and groundwater and nonpoint source issues. Four HUC-12 watersheds were selected in the Carson Valley and the NRCS State Conservationist agreed. They include the Town of Genoa-Carson River, Town of Gardnerville-East Fork Carson River, Lower West Fork Carson River, and the Brockliss Slough.

Multi-agency Coordination in the Humboldt Watershed

The newly formed Humboldt River Basin Network was funded to implement a Situational Assessment in SFY 2018. Unfortunately, the sign-ups for interviews with the National Riparian Service Team members were minimal. The State Conservation Committee discussed the effort in a public meeting, which triggered strong local political opposition to the effort. The core network group met several times to determine best next steps forward. Ultimately, due to the need for grass-root support of the effort, the core group decided that the effort needed to be cancelled at this time. Perhaps political will may shift in the future, but for now, the efforts of the HRBN are suspended. There was minimal effort in the Humboldt Watershed this year. However, on-going efforts at the South Fork State Recreation Area that have been funded in part through recent rounds of funding are summarized and presented as a Nevada Success Story in Appendix D.

Priority 3: Plan and Implement NPS Pollution Control Measures

The NPS Program supported implementation of NPS pollution control measures to achieve load reductions and incremental progress toward watershed improvement. NDEP coordinated with partners to identify the most appropriate action to address site-specific water quality impairments. Projects were prioritized based on local support, available resources and potential load reductions. Project updates describing this work is presented in Appendix C.

Priority 4: Implement Robust Environmental Education Program

The NPS Program continues to implement an effective environmental education program to create an informed and motivated public that supports and participates in NPS pollution prevention activities. Environmental education is accomplished through 319(h) contracted projects implemented by a network of local, state, federal and private partners who deliver watershed-specific programs to a diverse audience of stakeholders. This network includes CWSD, several conservation districts, City of Reno, UNCE, Clark County, Southern Nevada Water Authority (SNWA), TNC, Sierra Nevada Journeys, Nevada Outdoor School and Great Basin Outdoor School. These projects were implemented as usual during the first seven and a half months of SFY 2020. Unfortunately, due to the COVID-19 outbreak and subsequent halt of all in-person educational events and activities, the Program Coordinator at NDEP and our partners needed to determine alternative, distance learning or online options to implement programs. After strategizing, alternatives were created and are being implemented. Detailed information regarding contracted projects is included in Appendix C.

NDEP continued to work with established partners, and continued to expand the program throughout Nevada. Unfortunately, the Education and Outreach Coordinator position was vacated in early July, 2020 and remains empty. With Governor approval, the position will be filled soon.

Information regarding the education projects is outlined in the Appendix C with more information about NPS staff program implementation below.

Main accomplishments included:

- Conducting Project WET workshops for teachers and community educators;
- Publishing the Enviro-News newsletter quarterly and distributing it to hundreds of educators state-wide;
- Providing quality environmental education materials to school and community educators; and
- Supporting local and regional environmental education projects; and
- Working with partners to create and implement new education strategies necessitated by ongoing COVID-19 restrictions.

Implementation: Watershed Activities

Overviews of significant activities by watershed are delineated below. Specific steps toward milestones outlined in the SMP can be found in the Milestone Matrix (Appendix A). Detailed information about environmental results from active projects can be found in Appendix C (Project Updates) and Appendix D (Nevada Success Story).

Carson River

NDEP focused efforts on continuing successful partnerships that implement water quality improvement projects throughout the Carson River Watershed. The *Carson River Adaptive Stewardship Plan (CRASP)*, which provides an overview of the watershed, identifies potential sources of pollution, discusses short and long term strategies to mitigate pollution, provides a mechanism to track projects and addresses EPA's nine required key elements of a watershed based plan, has been updated to incorporate completed projects and identify new issues and concerns. Staff coordinated weekly with CWSD to assist with the review and to track progress toward completion of the updates. The final revision of the updated CRASP was delivered to NDEP and EPA on June 30, 2017 for final review and approval; and the update was approved by EPA in SFY 2018. CWSD is working with the Lahontan Regional Water Quality Control Board to have the California portion of the CRASP approved by the State of California and EPA. This work is ongoing.

NPS staff continued to support Carson Valley Conservation District (CVCD) to restore the sections of the Carson River between stateline and Carson City. CVCD applied for additional funding during the SFY 19 GFO and was awarded funds that included performing a geomorphological study of the entire reach of the Carson River from Genoa Lane to Washoe Tribal land boundary. After the study is analyzed, which was funded with match money, the District is working with their engineering firm, RO Anderson, to priorize a series of seven projects. The projects will then be constructed as this subgrant and subsequent subgrants, if awarded, are implemented.

During the annual GFO process, the Nature Conservancy (TNC) applied for and was awarded funds to perform restoration on the sections of the Carson River on River Fork Ranch in the Carson Valley. TNC works closely with CVCD staff to share resources and staff to increase cost effectiveness. TNC subgranted with NDEP in June 2020, so progress will be reported in the next annual report. A subgrant with Dayton Valley Conservation District (DVCD) to restore a section of the river near Fort Churchill was delayed due to construction issues and the subgrant expired. NPS staff is working with DVCD to enter into a new subgrant to perform this work.

Colorado River/Las Vegas Wash

NDEP focused efforts on supporting the active stakeholders who are implementing water quality improvements in the Las Vegas Wash through execution of the Comprehensive Adaptive Management Plan (CAMP). The main water quality issue addressed is reducing sediment in the Wash and educating residents in how to reduce nonpoint source pollution. The NPS Program's efforts are focused on supporting the extensive efforts being implemented by the local stakeholders. This includes funding priority projects consistent with the CAMP to reduce sediment and other NPS pollutants, and conducting environmental education programs. Coordination with Southern Nevada Water Authority (SNWA) and Clark County Water Reclamation District (CCWRD) continued that support priority project tasks consistent with the CAMP. Technical assistance and project oversight was provided for existing open contracts with SNWA and CCWRD. Due to COVID-19 restrictions, the scope of work involving in-person activities were amended and budgets were adjusted accordingly.

Humboldt River

As discussed above, an interagency network effort to kickstart watershed planning in the Humboldt River watershed have been suspended. However, NDEP continued to support efforts at the South Fork Reservoir through a subgrant with Nevada Division of Forestry. Detailed information on this effort can be found under Appendix D: Nevada Success Story. Where individual projects and interest come up, NDEP will focus efforts. If and when political will for a larger more cohesive effort occurs, further expansion of NDEP's efforts will ensue in the Humboldt.

Lake Tahoe Basin

NPS staff collaborated with Nevada Urban Implementers (Douglas and Washoe Counties, and NV Dept of Transportation) to implement the Lake Tahoe TMDL Program with the goal to meet the Clarity Challenge of 24 meters by 2031. During the reporting period, one registration was approved for a total of 56 credits. Nevada Urban Implementers made sufficient progress toward and achieving the 2021 milestone, securing 570 credits for the 2019 water year which equates to a fine sediment particle load reduction of 116,573 pounds per year. NPS staff coordinated with the California Lahontan Regional Water Quality Control Board (Water Board) to successfully implement another TMDL Management System cycle. This included: review and approval of Urban Implementing Partners annual stormwater and annual stormwater monitoring reports, developing the TMDL Performance Report and associated press release, Findings and Recommendations Memo, and TMDL Annual Strategy. TMDL Program Managers met with NDEP and CA Water Board management to review annual TMDL Program progress and approve and document programmatic improvement recommendations in the 2019 Decision Record Memo. Results and all documents were made available on the Lake Clarity Tracker on Lake Tahoe Info.

Truckee River Watershed

Under the umbrella of the One Truckee River Management Plan, NPS and ISWPP staff have been extensively coordinating to ensure success of the developing Source Water/Watershed Plan that encompasses the Truckee River Watershed from the Nevada state line through all of Washoe County. It has taken a lot of staff time to ensure coordination to prevent duplication of efforts and waste of public funds. The local entities decided to add $225,000 to the effort to update the Truckee Meadows Stormwater Permit Coordinating Committee 2003 Tributary Management Plan. The Tributary Management Plan, an integral portion of the overall Source Water/Watershed Plan and will result in prioritized lists of implementable projects that will reduce nonpoint source pollultion and help prevent contamination of source waters. Truckee Meadows Regional Planning Agency is creating the online planning tool portion of the plan through monies granted during the SFY 20 GFO. Because they entered contract late June 2020, and the work will be completed in early SFY 21, that project is not included in the Appendix C but will be in next year's annual report. Due to the increased participation and funding of the local entities, the timeline has expanded to allow for public meetings where monies and contracts were reviewed and approved. It is estimated that an approvable plan meeting all the requirements for both programs will be realized by the end of 2020.

Virgin River Watershed

While not a priority watershed, NPS staff became aware of a watershed planning group in the Virgin River watershed and began participating in conference calls with this group several years ago. Staff participated and are now part of a core planning group effort to that developed a watershed management plan for the Virgin River. The main drivers of this effort include The Nature Conservancy, American Rivers, and the Tamarisk Coalition. Many federal partners are also involved. The plan began to be developed in SFY 2018, and an MOU to detail the mission, goals, and methods of partner involvement was signed by stakeholders in SFY 2019. The plan was developed and approved by the stakeholders. The plan is not currently set up to meet the nine elements of a watershed plan as required by EPA. NDEP believes the plan and the MOU will lead to implementation of projects that will improve water quality and decrease nonpoint pollution in the Virgin River. NPS staff continues to attend annual Virgin River Partnership meetings and helps to determine how projects will be prioritized and implemented.

Walker River Watershed

In the past, NDEP worked with the Smith and Mason Valley Conservation Districts to implement small scale bank stabilization projects. Unfortunately, due to staff turnover and other factors, the Districts have not been focusing on water quality implementation projects for several years. Nevada Division of State Parks applied for and received money from the 319(h) GFO to increase riparian restoration on the recently acquired Walker River State Recreation Area. Because NDEP entered subgrant with State Parks in late June 2020, and work hadn't started during SFY 20, this project does not have a project highlight summary page.

Load Reductions

Load reductions were reported and entered into EPA's Grants Reporting and Tracking System (GRTS) in February 2020. The load reductions numbers reported (for the 2019 calendar year, half of which falls into SFY20) were:

Nitrogen, LBS/YR	**80,133**
Phosphorus, LBS/YR	**21,060**
Sedimentation-Siltation, TONS/YR	**4,740**

A detailed report on reported load reductions is attached as Appendix C.

Conclusion

Nevada's NPS Program has implemented the 2015-2019 SMP and met the milestones set forward. The revised SMP for 2020-2024 was submitted to EPA before the conclusion of SFY 2020 and is based on results and developments in the program. The NPS Program will focus efforts on the priorities of supporting and growing existing local watershed efforts, establishing new partnerships, planning and implementing NPS pollution control measures and implementing a robust environmental education program.

Appendix A: Milestone Matrix

Appendix A. Milestone Matrix

Goal/Objective	Strategy	SFY 20 Milestones	SFY 20 Workplan Steps	Due Date/ %Completed	Progress
Goal 1 Objective A Assess WQ	I. Statewide surface water monitoring	1.Id NPS Contributions	See 106 workplan	99% complete	IR submitted and imminent approval expected.
		b. submit 303(d) IR and Assessment Database to EPA	See 106 workplan	100% complete	Assessment database submitted to EPA.
		c. Determine trends for planning			
	II. Develop/revise WQS	1.Develop/revise WQS	See 106 workplan	Ongoing	WQS were revised and will be reported in Final 106 Report.
		2. Submit WQS to SEC, Legislature and EPA		N/A	
Goal1 Objective B Prioritize Impaired Waters	I. Prioritize impaired waters	1.Develop prioritization framework under Long Term Vision	See 106 workplan	80% complete	Prioritization Framework for TMDLs or Alternatives and Its Application for 2016-2022 is being revised and updated. Reaches of the Carson and Walker Rivers were selected to be prioritized for the 2020-2024. Prioritized reaches designated in submitted IR documentation.
		a. Initial assessment /prioritization list			
		b. Identify waters for restoration			
		c. Revise prioritization if needed			
		d. document prioritized waters in future IRs			
	II. Document and report success	2.Develop/publicize at least one success per year	-use indicators to document success and report/publicize project and success	100% complete	All project updates are attached. South Fork Reservoir is the incremental success story in Attachment D.
Goal 1 Objective C ID/implement activities to meet WQS	I. Provide efficient and effective administration of NPS program	1. Invest in WQ improvement/education projects to achieve WQ improvement	- work to develop projects	100% complete	SFY 20 Annual Report submitted 9/30/20 GFO issued July 2019 Project selection completed October 2019 Subgrants were developed. See list of selected projects in Summary.
		a. Release annual GFO with clear priorities and select projects	-provide funding/manage		
			-develop workplans and budgets		
			-process contracts		
		b. Ensure selected proponents have sufficient resources.	-provide technical assistance/project oversight	Annual Rpt 9/20 100% complete	
		c. Require BMP Effectiveness monitoring	-ensure logic models and measurable statistics in all projects	100% complete	Indicators to report project success were developed and have been incorporated into the SOWs of new contracts to ensure that appropriate statistics are gathered and reported.
		2.Data into GRTS	-Enter data in GRTS	2/20 100% complete	GRTS data entered February 2020 (FY 19 data). FY17 load reductions: Nitrogen: 80,13 lbs.; Phosphorus: 21,060 lbs.; Sediment: 4,740 lbs. Detailed analysis of load reductions is attached as Appendix B
			-Rpt streambank stabilized length		
			-Full project descriptions		
			-No. watershed plans under development		
		4. Report to EPA annually	-Prepare SFY20 NPS Annual Report	9/20 100% complete	SFY 20 Annual Report submitted 9/20

Goal/Objective	Strategy	SFY 20 Milestones	SFY 20 Workplan Steps	Due Date/ %Completed	Progress
	II. Provide BMP Resources	1.Create BMP Toolbox	-Create BMP toolbox	100% complete	Online resource updated and available on new NDEP website.
		2.BMP effectiveness monitoring past project feasibility	-Analysis of BMP effectiveness monitoring	100% complete	BMP effectiveness monitoring determined on a project by project basis.
	III. Coordinate with NDEP programs to address NPS problems	1.ID shared priorities with ISWPP Program 2.Develop action plan with ISWPP 3.Attend GWPTF meetings 4.Issue 401 certs	-Meet with ISWPP staff to ID shared priorities	100% completed for SFY 20	Staff are extensively coordinating SDWA and CWA programs. Both programs have been working with Truckee Meadows SW Permittees and the One Truckee River core group to develop SOWs for joint Source Water/Watershed Planning efforts. A coordinated Source Water/Watershed Management Plan has been developed. More details included in summary document. 401 Certifications were issued.
			-ID potential projects		
			-Develop action plan		
			-ID areas for integration		
			-follow up with ISWP staff		
			-Implement shared projects		
			-Attend GWPTF meetings -Issue 401 Certs		
Carson River	I. Implement Adaptive Stewardship Plan	1.Tech Assistance to revise CRASP	-Support CWSD	100% complete SFY 18	CWSD submitted final updated plan of the CRASP through Chapter 8 (Proposed Projects) 6/17 EPA comments and approval granted in SFY 18
			-Provide Tech Assistance		
			-Attend field trips, CRC mtgs		
			-meet to ensure 9 elements included		
			-manage contracts		
		2.Restore 250' channel to reduce sediment 50T/y & TP 50lbs/y	-meet to id priority restoration areas	100% complete for SFY20	Detail in Project Updates.
			-provide technical assist.		
			-assess load reductions and report		
			Provide funding, manage contracts		
			-attend field meetings		
			-provide technical review		
		4.Conduct Env ed programs	-technical assist, project oversight	Ongoing	Detail under Project Updates.
			-meet with Education Working Group		
			-assist with field demos		
			-provide funding for public education and manage contracts		
		5. Work with stakeholders to id/implement projects	- ID projects	Ongoing	GFO issued July 2019. Project selection completed October 2019. Detailed discussion about interaction with myriad stakeholders attached under Project Updates.
			-technical assist, project oversight		

Goal/Objective	Strategy	SFY 20 Milestones	SFY 20 Workplan Steps	Due Date/ %Completed	Progress
			-provide funding for and manage contracts		
	II. Implement Carson R. Floodplain Management Plan	1.Provide tech assist to revise by 2017	-attend CRC River Corridor WG meetings	100% complete	Carson River Floodplain Management Plan was approved in SFY 19.
			-support CWSD and CRC		
			-provide tech review		
			-meet to ensure it addresses WS elements		
			-attend meetings on plan approval		
Colorado River	I. Implement LVW CAMP	1.Fund priority projects consistent with CAMP	- meet with agencies to id priority restoration projects provide tech assistance	100% complete for SFY 20	Projects were administered during SFY 20 that are consistent with the CAMP. Detailed descriptions of related accomplishments are in Project Updates.
			-assess load reductions		
			-provide funding and manage contracts		
			-provide tech assistance		
		2.Conduct env education	-meet to id projects	Ongoing	Education campaigns were continued that implement CAMP goals. Detailed project descriptions are outlined under Project Updates.
			-assist with field demos		
			-provide funding and manage contracts		
Lake Tahoe Basin	I. Implement TMDL	1.Work with jurisdictions to meet load reduction targets 2.Fund and staff for project implementation	-provide tech assistance	100% complete for SFY 20	Contracts were overseen to ensure adequate progress toward load reductions. Detailed updates are located under Project Updates.
			-assess load reductions		
			-provide funding and manage contracts		
			-coordinate to track, assess and report TMDL progress		
		3.Collaborate with RB6 to implement TMDL Management System 4. Renew Interlocal Agreements including updated commitments	-compile research, tech findings and develop recommendations	100% Complete for SFY 20	
			-provide funding and manage contracts - renew agreements		
	II. Implement Regional Plan	1.Coordinate with stakeholders	-provide funding and manage contracts	100% complete for SFY 20	GFO issued July 2019. Project selection completed October, 2019. Detailed updates are located under Project Updates.
	III. Address nearshore water quality	1.Coordinate to implement Nearshore Quality Monitoring Program 2.Broadcast status and trend monitoring quality	-support staff and meet to coordinate to id possible tribs	100% complete for SFY 20	Staff took steps toward initiating contract to investigate feasibility of using remote sensing as a nearshore water quality monitoring tool.

Goal/Objective	Strategy	SFY 20 Milestones	SFY 20 Workplan Steps	Due Date/ %Completed	Progress
Humboldt River	I. Work with resources to address NPS pollution	1.Support HWCWMA coordinator to ID and implement projects Collaborate with stakeholders to identify trib for WSB planning	-support, meet with agencies to id willing stakeholders	100% Complete	NDEP's contract with the HWCWMA expired June 30, 2017. Further coordination with the WMA will predominantly be via the Humboldt River Basin Network (HRBN). The HRBN was funded to execute a Situational Assessment. Unfortunately, the HRBN's efforts met strong political opposition and as a result, the SA did not occur, and the grant money was returned to BLM. Staff attended USFS new staff training events to coordinate. Staff attended the NvACD annual meeting. NPS staff continues to follow the SET's grant program for GSG Habitat Improvement Projects to be funded by a $2M Legislative set-aside and other funding sources. Thus far most project types approved are upland habitat improvement projects. Timing of RFP announcements, project priorities, and federal funding are making leveraging with NPS grant funds difficult. Funding for PFC evaluations will not occur until and unless stakeholders determine if they are integral to moving forward with watershed planning. Project Updates give specific information re. specific implementation and env ed programs.
		2.Meet with BLM/USFS to ID WQ project opportunities	-support, meet to id willing stakeholders	100% complete	
		3.Attend NACD annual conf to find opportunities to partner	-support, meet with agencies to id willing stakeholders	100% complete	
		4.Meet with Sagebrush Eco Team, NDOW, NDSL to ID opportunities to partner	- support, meet with agencies to id willing stakeholders	100% complete	
		5.Support PFC assessment of 500'/year	-provide funding for PFC evaluations	Suspended	
		6.Conduct Env Ed programs	-provide funding and manage contracts	Ongoing	
Truckee River	I.WQS and TMDL revision	1.Work with stakeholders to complete WQS/TMDL review	-participate in review processes	Ongoing	Staff determined that WQS did not need to be addressed at this time. TMDL process is currently stalled and not sure if stakeholders will continue process. Staff continues participation in the Core Group of the One Truckee River. Development of a watershed-based plan with the Truckee Meadows Permit Coordination Committee in coordination with Source Water Protection Planning in Washoe County is nearing completion. Environmental Education was implemented through subcontracts and are discussed in detail under Project Updates.
			-attend approp. meetings		
	II. Build partnerships to implement projects	1.Work with partners to ID priority subwatersheds for WS planning 2.Conduct Env Education	-provide funding and manage contracts	100% complete	
Walker River	I. Work with stakeholders to address NPS	1.Restore 100' channel/y to reduce sediment 20 T/Y and TP 20 lbs/Y	-meet to id priority restoration projects	Ongoing due to flood	Status under Project Updates.
			-provide tech assistance and project oversight		
			-assess load reductions		
		2.Conduct Env Ed programs	-provide funding and manage contracts	Ongoing	

Goal/Objective	Strategy	SFY 20 Milestones	SFY 20 Workplan Steps	Due Date/ %Completed	Progress
Goal 2 Objective A	I. Implement Env Education Strategic Plan II. Support local ed efforts	1.Develop Strategic Plan 2.Conduct WET workshops 3.Assist with events 4. Public Enviro-News 5.Maintain Ed website 6.Provide ed to WS partners 7.Provide ed materials 1.Invest in ed projects 2. Require logic models for funded projects	-evaluate strategic plan and revise -id specific activities -prepared revised plan -WET workshops -conduct ed events -publish Enviro News -maintain website -create ed opportunities with partners -Provide ed materials -provide funding and manage contracts	100% complete	-New NPS Education and Outreach Coordinator was hired in February 2019. Strategic Plan for SFY 20 was completed. -Project WET workshops were planned and implemented. -Myriad educational events were held. -Enviro-news was published quarterly. -Education materials were distributed and ed projects were managed. -Specific contract information regarding env ed is located under Project Updates.
Goal 3 Objective A	I. Provide opportunities for collaboration	1.ID agencies 2.Technical workshops with agencies 3. Develop action plans 4.Provide tech assistance, ed, training 5.Establish contacts info for GFO 6.Provide opportunity for participation in triennial review 7.Annually request info on NPS projects	-ID partners and make list for GFO -provide technical assistance, ed and training on developing projects (workshop) -develop action plan with ID'd partners -request WQ and NPS data from partners for annual report.	100% complete	-Contact list for GFO created. -Many interactions with stakeholders are described under the watershed in which they are occurring.
	II. Coordinate wih NRCS on NWQI	1.Participate in State Tech Committee 2.Meet with NRCS to develop shared priories and id project 3.Partner with NRCS to transfer lessons learned from NWQI 4.Engage NRCS about state WQ priorities	-attend State Technical Comm meetings -discuss farm bill and id projects -partner to assess lessons learned -engage NRCS about WQ priorities	100% complete	State Technical meeting was attended. Staff met with NRCS to provide input on NWQI watershed projects and updates on implementation. More detail in Summary.
	III. Implement MOU between NDEP and USFS	1.Meet with FS to discuss MOU and id shared priorities. 2.Develop action plan	-meet with FS and ID priorities -develop action plan	100% complete	Staff met with the Forest Service to discuss common goals and to compare program priorities.
Goal 3 Objective B	I. Ensure federal and state program consistency	1.Review and comment on EAs, EISs and RAMPs 2.Participate in develop of BLM Resource Area Plans and id potential NPS projects	-.review and comment on EAs, EISs and RAMPs -participate in develop of BLM Resource Area Plans and id potential NPS projects	100% complete See above. 0% complete	NPS staff receives all documents from the State Clearing House to ensure that all relevant federal proposed actions are reviewed for water quality impacts. This includes BLM Resource Area Plans and USFS actions.

Goal/Objective	Strategy	SFY 20 Milestones	SFY 20 Workplan Steps	Due Date/ %Completed	Progress
		3.Evaluate feasibility of working with BLM and EPA to conduct stream and river surveys on public lands	-evaluate feasibility of working with BLM and EPA to conduct stream and river surveys on public lands		This milestone has not gained traction during the 2015-2019 SMP. It will be removed from the SMP Update.

Appendix B: Load Reductions

DATE: March 3, 2020

TO: Birgit Widegren, NPS Program Branch Supervisor,
Water Quality Planning

FROM: Jon Paul Kiel, Environmental Scientist,
Water Quality Planning

RE: EPA Grants Reporting and Tracking System (GRTS) Annual Load Reduction Reporting and Database Administration for the State of Nevada

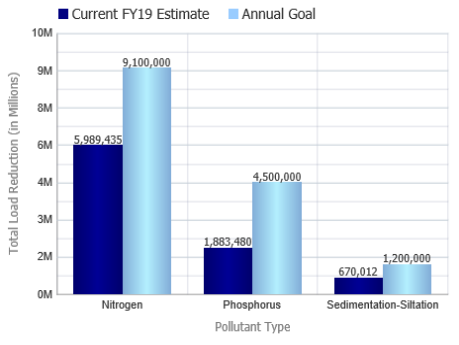
I have completed GRTS 319(h) Grant Project Load Reduction database entries for calendar year 2019. This year entries were due to EPA on or before February 28, 2020. Data was entered prior to the deadline for projects that implemented BMPs in 2019, or where a substantial number of BMPs were installed during the year for projects with multiyear BMP installations.

GRTS Load Reduction Outputs

GRTS Load Reduction OBI Reporting Outputs are shown below. All OBI data outputs in this report were obtained on March 3, 2020.

National Numbers

FY19 - FY20 National Load Reduction Estimates
Current Real-Time Data



Pollutant Type	Unit of Measure	Current FY19 Estimate	Annual Goal
Nitrogen	LBS	739	9,100,000
Nitrogen	LBS/YR	5,988,696	9,100,000
Nitrogen	TONS/YR	0	9,100,000
Phosphorus	LBS	501	4,500,000
Phosphorus	LBS/YR	1,882,979	4,500,000
Phosphorus	TONS/YR	0	4,500,000
Sedimentation-Siltation	LBS/YR	0	1,200,000
Sedimentation-Siltation	TONS	441	1,200,000
Sedimentation-Siltation	TONS/YR	669,571	1,200,000

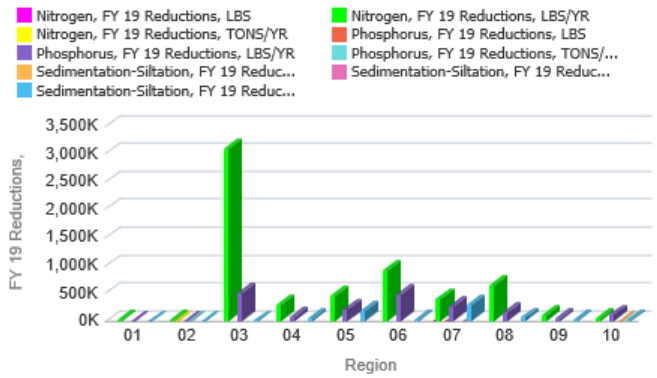
Regional Numbers

FY19 - FY20 Load Reduction Estimates by State/Region

Current Real-Time Data

By Region

FY 19 Reductions



	Nitrogen	Nitrogen	Nitrogen	Phosphorus	Phosphorus	Phosphorus	Sedimentation-Siltation	Sedimentation-Siltation	Sedimentation-Siltation
	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions	FY 19 Reductions
Region	LBS	LBS/YR	TONS/YR	LBS	LBS/YR	TONS/YR	LBS/YR	TONS	TONS/YR
01		24,541			4,458				1,338
02		22,946	0		6,692	0			5,534
03		3,082,906			495,487				8,950
04		292,938			83,196				41,574
05		447,461			216,793				183,440
06		908,540			489,866				24,586
07	739	404,511		501	273,818			441	294,960
08		633,700			158,600				63,124
09		113,671			37,563				27,623
10		57,483			116,505		0		18,441
Grand Total	**739**	**5,988,696**	**0**	**501**	**1,882,979**	**0**	**0**	**441**	**669,571**

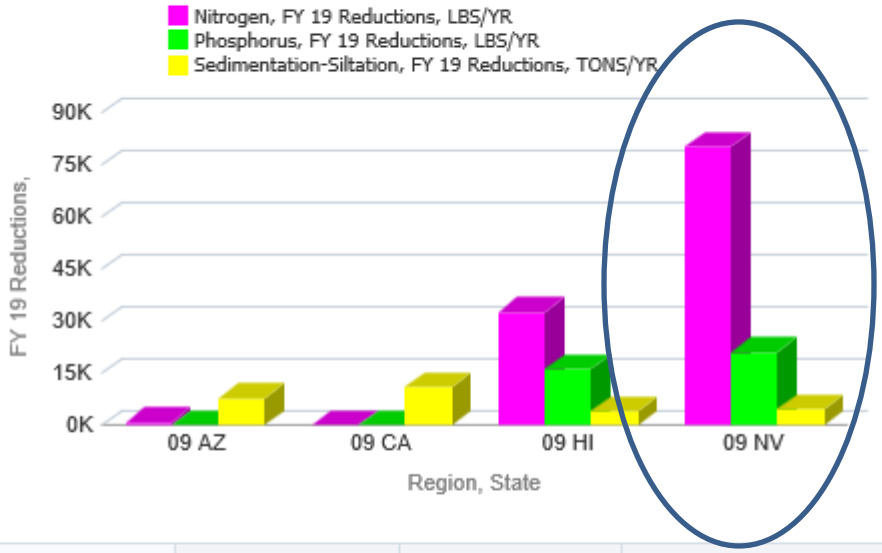
State Numbers

FY19 - FY20 Load Reduction Estimates by State/Region

Current Real-Time Data

By Region

FY 19 Reductions

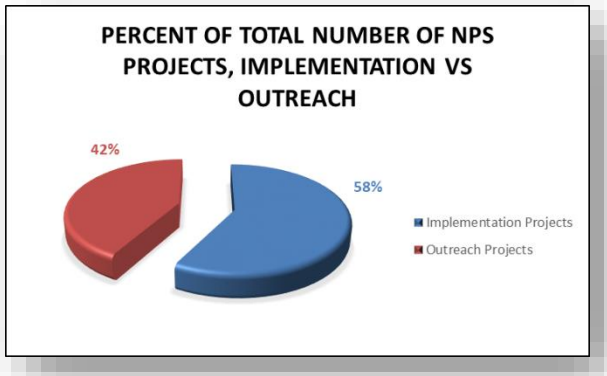


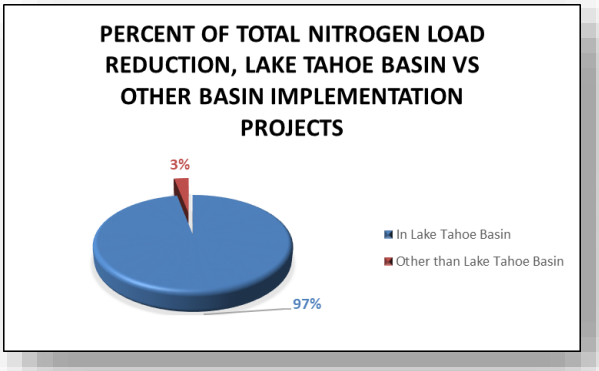
		Nitrogen	Phosphorus	Sedimentation-Siltation
		FY 19 Reductions	FY 19 Reductions	FY 19 Reductions
Region	State	LBS/YR	LBS/YR	TONS/YR
09	AZ	884	202	7,774
09	CA	0	0	11,090
09	HI	32,654	16,302	4,019
09	NV	80,133	21,060	4,740
Grand Total		113,671	37,563	27,623

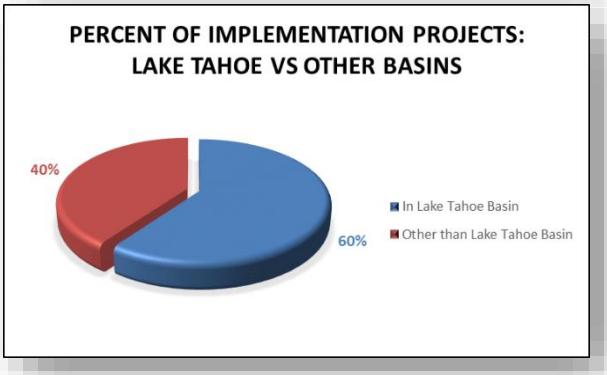
Nevada's Active 319(h) Grant Supported Project Inventory

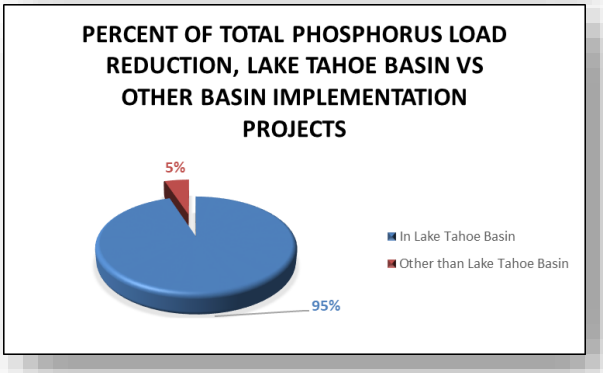
Nevada's 2019 active 319(h) project inventory contained 42 percent public outreach and education projects, and 58 percent BMP Implementation projects. Most public outreach projects do not include a measurable load reduction element. Conversely, many implementation projects include a public outreach element. Of the load reductions realized as a result of BMP implementation, BMPs installed in the Lake Tahoe Basin comprised between 43 and 97 percent of the reductions* realized during calendar year 2019. The nitrogen and phosphorus percentages were on par with reductions seen in several past calendar years. Reductions in sediment load due to Tahoe BMP Implementation is down percentage wise in part because sediment load reductions in the Carson and Walker river basins were higher than in past reporting years.

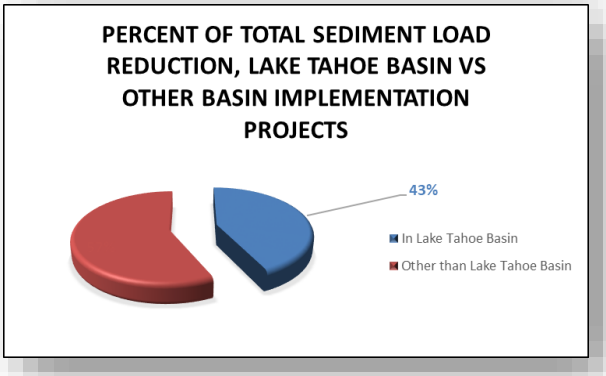
*97% based on N, 95% based on P, 43% based on Sediment.











Nevada Load Reduction Trends

Nevada's 2019 GRTS OBI outputs show that load reduction amounts for nutrients replicated 2017 levels, while reductions in sediment were similar to those in 2015. Reductions in pounds and tons are shown below:

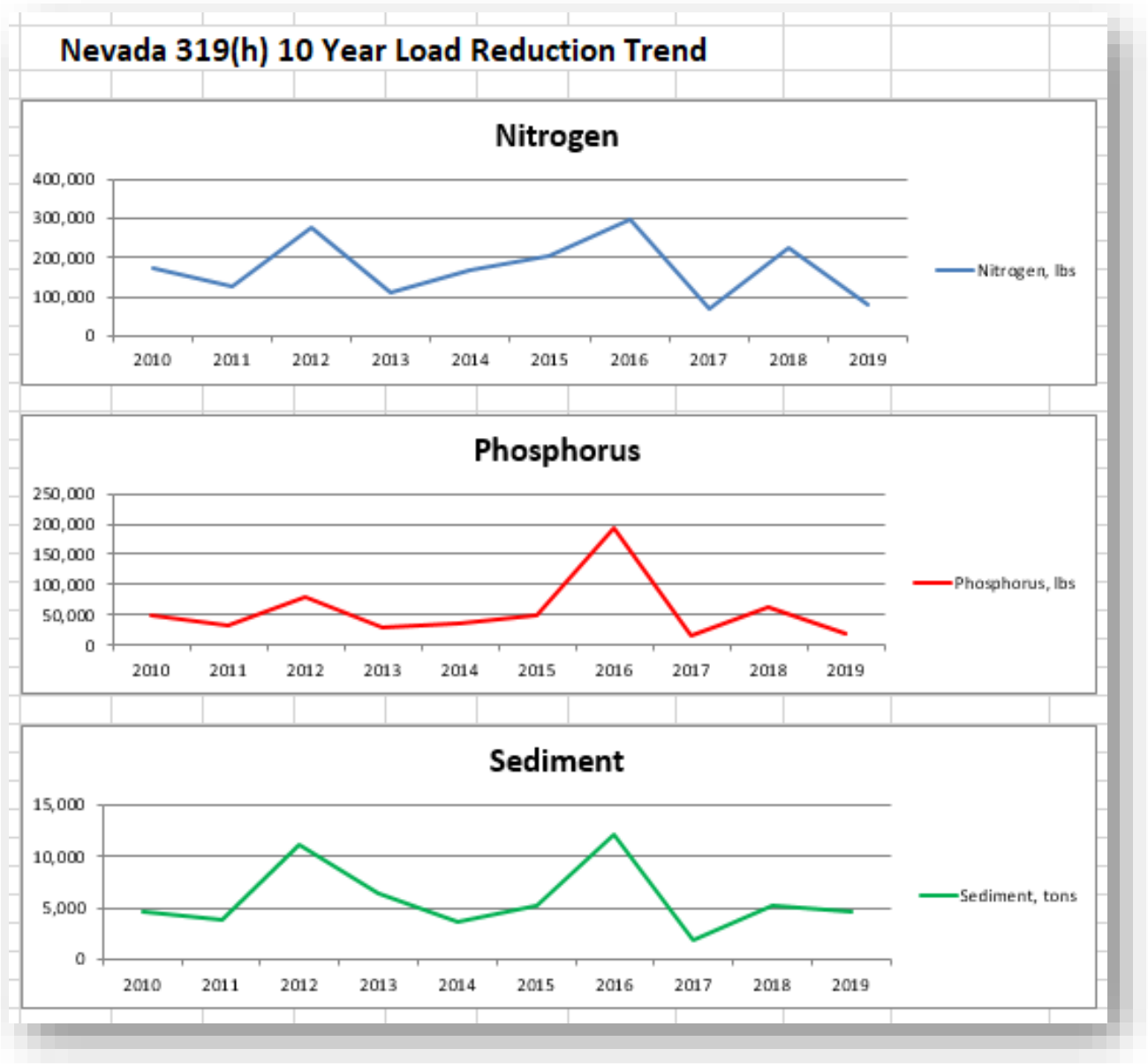
	Nevada 319(h) Load Reductions by Year, Average Load Reduction										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average LR
Nitrogen, lbs	171,151	126,642	276,559	112,200	166,416	202,357	298,144	70,043	224,146	80,113	172,777
Phosphorus, lbs	48,877	34,005	78,361	29,883	37,993	50,197	192,020	18,007	64,067	21,059	57,447
Sediment, tons	4,598	3,883	11,179	6,407	3,706	5,256	12,183	1,846	5,231	4,739	5,903

Load reductions attributed to BMP installations and retrofits to commercial and multifamily properties on the Nevada side of the Lake Tahoe Basin comprise the bulk of the state's total load reductions, but reductions are also attributed to new technology incorporated into roadway operations in the Basin. Tahoe Basin roadways are receiving less traction sand during winter, and material recovery has improved with the use of more efficient sweepers.

As noted above, approximately half of Nevada's 319(h) grant dollars go to public outreach and education efforts. A load reduction metric cannot be used to evaluate the effectiveness of these projects, yet without these ongoing efforts to educate citizens, nonpoint source pollution particularly in populated areas would certainly be worse. Recently plastic trash has specifically been targeted by public outreach campaigns in the context of NPS pollution, with an emphasis on single-use plastic bottles. Messaging aims to limit their consumption and promote recycling. Currently, four coastal states have trash specific TMDLs. Reducing trash first requires a determination of baseline levels followed by short and long term reduction plans towards total elimination. A primary objective of coastal states is to reduce trash loading to streams that lead to beaches and ultimately the ocean. Microplastics in the ocean environment is a primary concern.

Unfortunately, microplastics have also been found on the beaches and suspended in the waters of Lake Tahoe. California has a goal of 0% trash by 2030. Presumably, efforts towards reaching this goal will benefit the Nevada side of the Lake. In addition to California's efforts, Nevada is funding research and outreach efforts aimed at reducing the amount of microplastics at the Lake. Reducing nonpoint source pollution in Nevada is and will continue to be a challenge but remains important in the nation's driest state where water resources are scarce.

The line graphs below show Nevada's reportable load reductions by year due to NPS Pollution Management Grant Program project implementation:



Load reductions by watershed with reportable amounts for the Calendar Year are shown below:

Load Reduction by Watershed

	Nitrogen, lbs	Phosphorus, lbs	Sediment, tons
 Colorado River Basin	1.50	0.20	0
 Carson River Basin	1,993.70	996.80	1,172.00
 Humboldt River Basin	45.60	7.70	0
 Lake Tahoe Basin	78,092.40	20,055.20	2,017.85
 Walker River Basin	0.00	0.00	1,550.00

Calculation of Load Reductions

Load reduction numbers for calendar year 2019 were generated using EPA STEPL and Region 5 load reduction models, and in the case of reductions reported for Lake Tahoe BMP implementation, using the Tahoe Region's Pollutant Load Reduction Model with variable assumption inputs related to a specific project type.

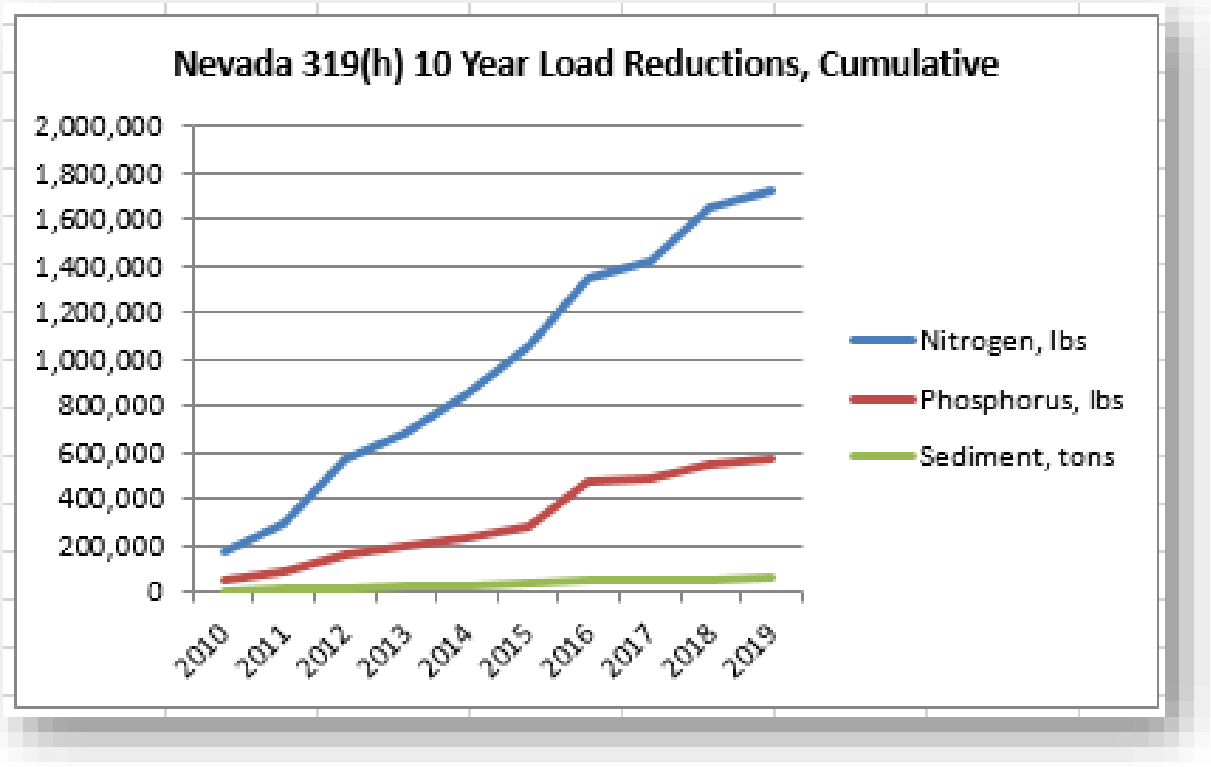
There are several open 319(h) grant funded projects in the basin that are scheduled to be completed in 2020 or later, at which time any associated load reductions would subsequently be reported.

Program Cumulative Load Reductions

Annual fluctuations in reportable load reductions occur for a variety of reasons. One example occurs when an active implementation project is scheduled to have BMPs installed once at the conclusion of a grant contract's term. If it is a multiyear project, in the early years no load reductions can be attributed to the project. Because of timing alone, a state could have the exact same suite of project types being implemented between years, but the load reductions could be different due to timing of actual BMP installation.

Nevada's ten-year, cumulative load reduction numbers and curves for nitrogen, phosphorus, and sediment are shown below:

	Nevada 319(h) 10 Year Load Reductions, Cumulative									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nitrogen, lbs	171,151	297,793	574,352	686,552	852,968	1,055,325	1,353,469	1,423,512	1,647,658	1,727,771
Phosphorus, lbs	48,877	82,882	161,243	191,126	229,119	279,316	471,336	489,343	553,410	574,469
Sediment, tons	4,598	8,481	19,660	26,067	29,773	35,029	47,212	49,058	54,289	59,028



Reported Calendar Year Load Reductions versus Cumulative

In addition to load reductions associated with public education efforts that cannot be measured or otherwise captured, EPA's Grant Reporting and Tracking System does not account for load reductions resulting from continued BMP performance beyond the load reduction reporting calendar year. Cumulative load reduction metrics are not captured via GRTS, and therefore are not reported to Congress. Yet the benefits of installed BMPs typically continue well beyond the reporting year. These benefits are not reported in part because the performance of BMPs over an extended time can be extremely variable. The accuracy in calculating cumulative loading in most cases would be so low as to make this information unreliable. States and EPA acknowledge the ongoing, cumulative benefit but simply do not attempt to quantify it.

The variable that has the greatest impact on continuing BMP performance is BMP maintenance. In many cases, BMP monitoring is needed to evaluate maintenance needs. Both are dependent upon resources that are often not included in a BMP project budget, so it is common for BMPs that would benefit from maintenance to not receive it.

Despite a lack of maintenance, when a BMP performs at a high level for more than a year, the cumulative load reduction benefit over time that is not captured by GRTS is an important factor that deserves mention in the context of NPS pollution management. As additional BMPs are implemented in a watershed, resources may eventually be directed to maintenance and later, complete BMP replacement by higher performing installations.

GRTS Mandated Elements

Nevada GRTS Reports (EPA query outputs) currently indicate 40 project records with Mandatory Element Errors for *project years* 2002 through 2019, and dozens of Load Reduction errors. States are required to use GRTS to report all nationally mandated elements described in the most recent GRTS memorandum located on the GRTS website (www.epa.gov/nps/grts). The mandated elements are comprised of parameters that EPA needs in order to account for and report to congress the accomplishments of the § 319 program from a nutrient and sediment load reduction standpoint.

All of Nevada's Mandatory Element and Missing Load Reduction Errors are the result of a revised EPA report query connected with the database's Budget Copy Tool. The errors reported tie back to "child" project records created by this tool that is used to relate project budget information when funded by multiple grants. Although the Mandatory Error Report suggests project data is missing, it can be quickly found in a project's parent record. Database contractors are currently debugging the query that generates these errors (40 projects x 7 errors = 280 Mandatory Element fields that trigger an error).

Projects with Missing Load Reductions

The same flawed query that results in Mandatory Errors associated with the Budget Copy Tool generates a list of Nevada Projects with *Missing Load Reductions*. The load reductions flagged as missing can be found in the Project's Parent Record. In those cases where the Budget Copy Tool generated "child" records for projects that have no load reductions associated with them (Public Outreach projects for example), missing load reduction errors are also generated, as the project's parent record would not include load reduction information in the first place.

Questionable Load Reductions

The GRTS's database includes a list of the year's *Questionable Load Reductions* that prompts state GRTS administrators to explain why load reductions by project are very small, or very large. Many 319(h) grant funded projects contain goals in addition to reductions in loading that GRTS data fields may not prominently reveal, and due to the database's framework, these goals may not filter up to Congress in a report. In some cases, it is merely a matter of a project's scale that translates into either small or large load reductions.

In some cases, load reductions may not be the primary purpose of a project, yet a small load reduction may be calculated and reported. In the case of a stream restoration project on the north shore of Lake Tahoe, the project's primary purpose was to restore stream flow impeded by an undersized roadway culvert. Increased stream flow and improved fish passage, in this case, was the primary project purpose. When observed alone, the load reduction reported suggests a poor result. A complete look at the project objectives tells a more positive story.

In the case of the biannual Green-Up Event organized by the Southern Nevada Water Authority, this revegetation effort combines the restoration of disturbed floodplain terraces with public outreach. The Water Authority recruits volunteers to install native plants while educating them about the importance of wetland and

floodplain function. The minor nutrient and sediment load reduction outputs of the generic Region 5 model suggest that this project is not successful, but this narrow view of the project is clouded. Most land restoration projects employing volunteer help might generate the interest and turnout of a few dozen volunteers during a field season. During the 2019 Fall Green-Up Event, over 600 volunteers registered and participated. Based on both the restoration effort and number of citizens presented with conservation outreach messaging, this is one of Nevada's most successful projects that is supported with 319(h) grant funding.

Las Vegas Wash Newsletter

Fall Wash Green-Up a huge success

On Oct. 5, more than 600 volunteers spent their Saturday morning planting approximately 7,000 native trees and shrubs at the Fall Wash Green-Up.

The Green-Up site was cleared for the expansion of the Historic Lateral Weir. The new plants will help stabilize soils, beautify the Wash, and provide habitat for wildlife.

Another example of a Nevada Lake Tahoe Basin project that reports small load reductions involves the use of highly efficient roadway sweepers allows for a more complete collection of roadway sediment, including abrasives placed by spreaders for public safety during winter storms. Sediment that is not captured and then driven over by vehicles is broken down into Fine Sediment Particles (FSPs). These particles, smaller than 0.020 mm in size, are known to be one of the primary causes of Lake Tahoe's degraded lake clarity. These extremely small particles remain suspended in the water column for extended periods, clouding the lake before potentially aggregating into larger particles that more quickly settle to the Lake's bottom. One pound of FSP's prevented from being discharged to Lake Tahoe is worth one ton of sediment retained in a midwestern corn field.

Back to Lake Tahoe again, a project reports an improbable reduction in nitrogen, phosphorus, and sediment due to implementation of BMPs during calendar year 2019. In this case, the numbers are high because the project

scope includes treatment of hundreds of individual parcels. Cumulatively, these add up to large numbers attributed to the singularly funded project, which is a collection of smaller efforts utilizing similar source control and/or stormwater treatment methods.

Funds are Adequately Leveraged

Nevada appears to have successfully leveraged the relatively small percentage of 319(h) funding budgeted nationally (0.85 percent). Nevada's match to grant ratio, as reported by EPA GRTS query outputs, compares to other Region 9 states as follows:

R9	Total 319(h) Funds Expended, 2002 - 2017	Total Match Expended	Match Ratio
AZ	$24,253,278	$3,893,480	0.16
CA	$81,184,485	$90,002,453	1.11
HI	$15,233,605	$8,212,183	0.54
NV	$14,926,012	$21,141,022	1.42

I do not think these figures are accurate. Other R9 states may not be accurately inputting match dollars or they have not caught up with the input of project cost share values. Regardless, Nevada's match of nearly three dollars expended on projects for every two dollars granted is a respectable number. The ratio reported above represents cost share expenditures originally budgeted for a project. In many cases, the actual cost share expenditure is higher than the original contractual amount.

In the coming months, as new project contracts are executed, new project information will be entered into the database and Mandatory Errors addressed as soon as possible.

Appendix C: Project Updates

Cradlebaugh Bank Rehabilitation

Carson Valley Conservation District (CVCD) DEP S 18-028

Project Partners:
Carson Water Subconservancy District

Project Location:
Carson River Watershed, Douglas County

Project Goals:

- ✓ *Implement bank stabilization downstream of Cradlebaugh Bridge*
- ✓ *Mitigate erosion, enhance wildlife habitat and improve water quality*

Project Summary:

700 feet of bank was reshaped to create an inset floodplain or overflow swale to reduce stress on meander bend. Rock was used to stabilize the toe and various bioengineering techniques were used to revegetate the project site. New fencing was be installed to exclude livestock from project site. All permits and approvals were obtained prior to the start of construction.

Project Outcomes:

- ✓ *Stabilize and revegetate eroding river bank downstream of major highway bridge.*
- ✓ *Region 5 model load reduction estimate: 825 to 950 tons/year of sediment based on loss of approximately 40 feet of bank over a 24 year time period (1994-2018).*

Fiscal Summary:

319(h) grant award	$ 87,500.00
319(h) funds expended to date	$ 87,500.00
Non-federal match	$ 298,361.27

Project Status: Construction completed winter 19/20. Subgrant closed.

Genoa West Fork Carson River Bank Stabilization Phase 1

Carson Valley Conservation District (CVCD) DEP S 20-062

Project Partners:
Carson Water Subconservancy District

Project Location:
Carson River Watershed, Douglas County

Project Goals:

- ✓ *Perform geomorphological study of reach of Carson from Genoa Lane to Washoe Tribal Property*
- ✓ *Determine best sites to perform bank stabilization on and prioritize*
- ✓ *Design and implement highest priority restoration project*
- ✓ *Utilize drone data to monitor and track success*
- ✓ *Mitigate erosion, enhance wildlife habitat and improve water quality*

Project Summary:

Execute geomorphology study and locate and prioritize restoration projects for reach of West Fork Carson River. Restore vertical cutbanks approximately ¾ mile ong and 12-15 feet high. Combine hard structure (riprap) with bioengineering techniques to stabilize the soil, improve water quality and re-establish desirable vegetation for wildlife.

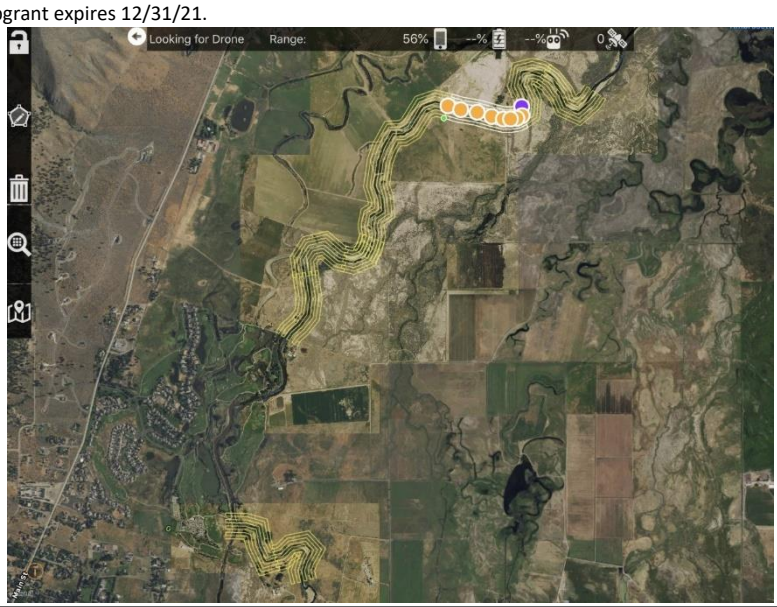
Project Outcomes:

- ✓ *Evaluate and plan strategy to stabilize and revegetate large reach of West Fork Carson River*
- ✓ *Implement restoration projects in Phases*
- ✓ *Use drones to monitor and report success*
- ✓ *Model sediment load reductions using both drone digital elevation models and Region 5 model*
- ✓ *Draft geomorphology study, preliminary prioritization strategy and draft engineering plans submitted 4th Quarter SFY 20*

Fiscal Summary:

319(h) grant award	$ 100,000.00
319(h) funds expended to date	$ 5,843.75
Non-federal match	$ 540,000.00

Project Status: Initiated 4/28/20. Subgrant expires 12/31/21.



Drone flight paths over several reaches of Carson River in the Carson Valley, Douglas County, NV

Watershed Coordination Program

Carson Water Subconservancy District (CWSD) DEP S 18-016

Project Partners:
Alpine, Carson City, Churchill, Douglas, Lyon and Storey Counties

Project Location:
Entire Carson River Watershed

Project Goals:

- ✓ Implement the Carson River Watershed Adaptive Stewardship Plan and Regional Floodplain Management Plan
- ✓ Regional coordination of projects and programs that protect water quality and improve riparian areas
- ✓ Regional coordination to implement land use practices that protect the river system
- ✓ Increase public awareness regarding nonpoint source pollution and solutions the community can provide

Project Summary:

CWSD is charged by the Nevada Legislature to coordinate an integrated approach to watershed management, and was appointed by the Governor as the 208 Water Quality Planning entity for the Carson Basin. The Integrated Watershed Planning Process (IWPP) actively brings together diverse public and private parties that have a vested interest in the health of the Watershed. The Carson River Coalition (CRC) was formed in 1998 to address Watershed issues on an integrated, coordinated basis and to serve as the steering committee for the IWPP. The CWSD and the CRC developed a Stewardship Plan that meets EPA's nine required elements of a watershed-based plan. The Program will continue to work with stakeholders to implement this plan and to track and assist with the progress of projects identified in the plan.

Project Outcomes:

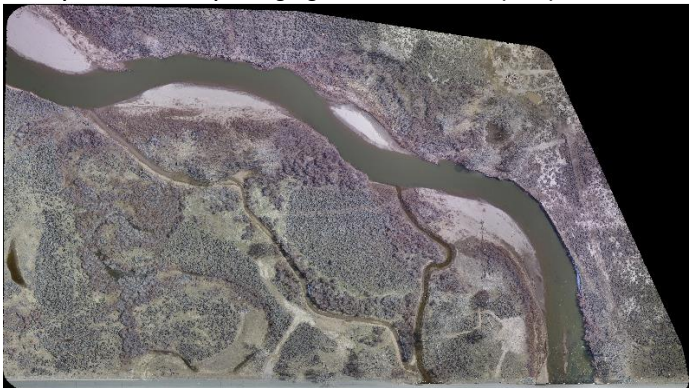
- ✓ Staff worked with Army Corps to conduct more detailed Phase II Alluvial Fan Study for planning purposes. Phase I identified potential high risk areas.
- ✓ Worked with consultant to update county floodplain ordinances.
- ✓ Staff established program to conduct drone monitoring of selected projects along the river.
- ✓ Presentation developed regarding the importance of fluvial geomorphology.
- ✓ Organized and held stakeholder workshop in October which highlighted funding sources and river projects in Alpine County, Carson Valley and Dayton Valley.
- ✓ Staff have participated in numerous educational activities throughout the watershed in the past year including STEAM nights at local elementary schools, Snapshot Day, Flood Awareness Week and presentations to area boards and commissions.

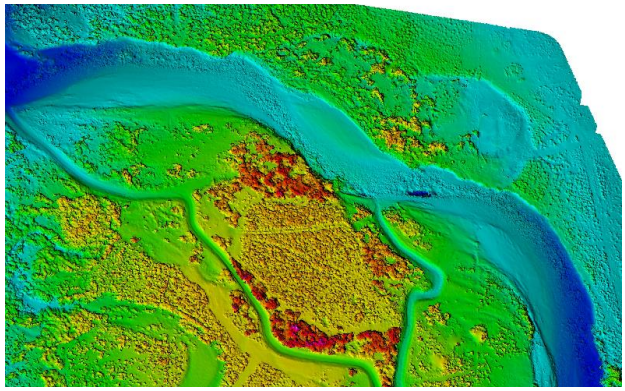
Fiscal Summary:

319(h) grant award	$162,840.00
319(h) funds expended to date	$162,840.00
Non-federal match generated	$198,079.61

Project Status: **Complete. Subgrant closed 12/31/19.**

Drone photo and corresponding digital elevation model (DEM)





Walker River Mitchell Bank Stabilization Project

Mason Valley Conservation District DEP S 17-014

Project Partners:
Private Property Owner
NDOW

Project Location:
Walker River, South of Yerington
Lyon County

Project Goals:

- ✓ *Mitigate erosion*
- ✓ *Reduce sediment and nutrient loadings to the Walker River*
- ✓ *Protect infrastructure*

Project Summary:

Mason Valley Conservation District (MVCD) identified an unstable riverbank on the West Walker River in Lyon County for rehabilitation that is threatening an access road and an irrigation ditch.

Project Outcomes:

- ✓ *Damage caused by winter 2017 high flows*
- ✓ *Approximately 720 linear feet of bank stabilized*
- ✓ *Region 5 model estimates an average of 1550 tons/year of sediment will be kept out of river*

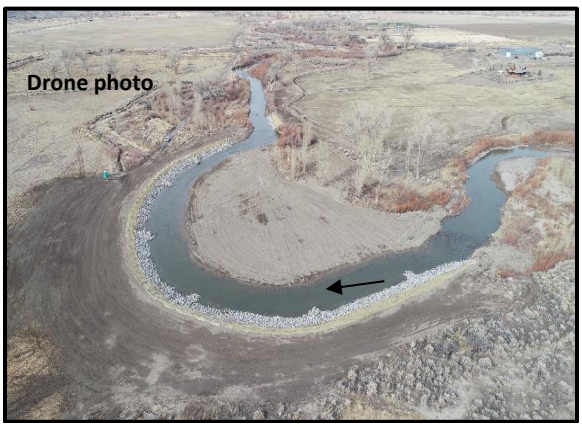
Fiscal Summary:

319(h) grant award	$142,320.00
319(h) funds expended	$142,055.43
Non-federal match funds generated	**$240,443.71**

Project Status: Project constructed winter 2019 and successfully withstood spring runoff. Contract expired 12/31/19.

June 2016 Pre-construction Photos

Post Construction 2019



Carson River Watershed Environmental Education Program

River Wranglers *DEP S 20-014*

Project Partners:
Carson Water Subconservancy District
Carson Valley Conservation District
Dayton Valley Conservation District

Project Location:

Carson River Watershed:
Douglas, Lyon, Storey, Churchill County,
Carson City County and Alpine County, CA

Project Goals: *Maintain partnerships with local schools and offer opportunities for increased knowledge and understanding of nonpoint source pollution (NPSP) on a watershed basis by fulfilling the following tasks:*

Inform students and educators, clubs and service groups about watershed concepts, with the message that what they do on land affects the health of local streams and water bodies.

- ✓ *Provide the materials and knowledge to integrate EE programs into school curriculums, and club and service groups' ethos and culture.*
- ✓ *Conduct workshops, training sessions, and field days in the Carson River watershed.*
- ✓ *Facilitate a change in "citizen" behavior by informing participants how their personal habits and lifestyles impact their environment.*

Project Summary:
The Environmental Education Program introduces, promotes, and sustains an environmental education focus on NPSP prevention for local schools, clubs and service groups within the Watershed. The program recognizes that youth and children are our future leaders and policy makers, and are proven and effective messengers to older age groups (Lisboa 2001). Additionally, River Wranglers' core environmental education model engages high school student mentors to teach younger students environmental stewardship of our riparian areas.

Project Outcomes to Date:

- ✓ *Provided education to numerous schools, club and service groups throughout the watershed.*
- ✓ *Held Snapshot Day on the Carson River with over 300 students.*
- ✓ *Developed/updated Logic Model for River Wranglers.*
- ✓ *Pre- and post-tests administered.*

Learning about macroinvertebrates

Fiscal Summary:

319(h) grant award	$114,373.78
Non-federal match generated	$118,378.03

Related Project Weblinks: http://www.riverwranglers.org/
https://www.facebook.com/riverwranglersnv/

Project Status: **In progress, contract terminates 6/30/21.**

Tahoe Water Quality Education & Action

Great Basin Outdoor School *DEP 18-020*

Project Partners:
Tahoe Environmental Research Center
Galilee Camp and Conference Center
Marine Research and Education, Inc.
Nevada Fish & Wildlife, and more

Project Location:
State-wide
Primarily Lake Tahoe, Truckee and Carson River Watershed

Project Goals:

- ✓ *Promote critical thinking about local environmental issues including water quality.*
- ✓ *Promote personal responsibility for improving and protecting the environment.*
- ✓ *Increase awareness of point and nonpoint source pollution.*
- ✓ *Promote student academic achievement and support curriculum standards.*
- ✓ *Promote interpersonal relationship and social skills and community involvement.*

Project Summary:

This program offers youth and adults an opportunity to learn as they participate in a four-day residential camp with field studies that build academic and social skills and develops understanding of the natural world. Fifth and sixth grade classes, high school and college students, and teachers study local ecology with standards-based lessons at Camp Galilee, Lake Tahoe during spring, fall, and winter programs. Service-learning projects and place-based education help to instill and develop a commitment to sustainability and a connection to the earth.

Project Outcomes:

- ✓ *Hundreds of students served from Reno, Sparks, Carson, Gardnerville, Incline, and Zephyr Cove.*
- ✓ *Study on-board the research boat included observing plankton & discussing the aquatic food chain, measuring water quality, & hearing about invasive species. Activities on shore focused on arresting non-point source pollution and learning about Lake Tahoe.*
- ✓ *Service-learning focused on projects to reduce erosion and inputs of NPS pollutants into Lake Tahoe.*

319(h) grant award	$ 78,516.00
Non-federal match generated	$132,674.91
Related Project Weblinks:	http://www.greatbasin-os.org/

Project Status: Subgrant ended 6/30/20.

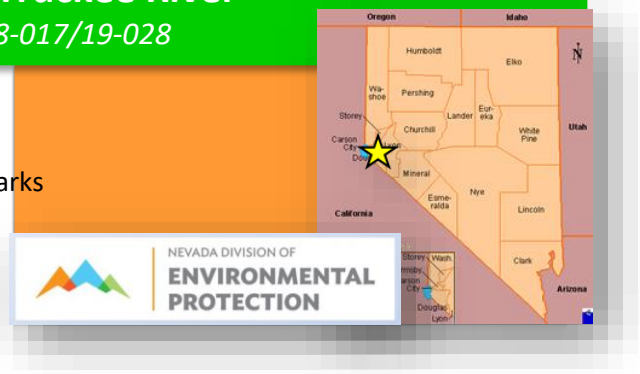
Left image: Camper recording data on Lake Tahoe clarity and water quality.

Upper Right image: Campers on The Prophet learning about Tahoe's clarity.

Right image: Campers learn about watersheds using the Tahoe watershed model.

Watershed Management Plan for the Truckee River

Nevada Land Trust *DEP #18-017/19-028*



Project Partners:

One Truckee River, Keep Truckee Meadows Beautiful
City of Reno, Western Regional Water Commission, City of Sparks
Washoe County, Truckee Meadows Water Authority, Truckee Meadows Regional Planning Agency, many others

Project Location:

Truckee River Watershed in Washoe County

Project Goals:

The overall goal is to create a comprehensive Watershed Management Plan that includes an online tool for communities in Washoe County to help protect their drinking water sources and manage the Truckee River watershed to maintain and or improve water quality. The stakeholder-driven tool must have the following qualities:

- Have regional support and approval – be adopted by local jurisdictions,
- Include a process for implementation with roles and responsibilities,
- Be complimentary to, coordinated with and consistent with existing plans,
- Identify water quality problems and solutions not already addressed,
- Be useful to funding and regulatory agencies,
- Include a process to show benefits and accomplishments upon implementation of the Watershed Management Plan, and
- Include a list of prioritized implementable projects.

Project Summary:

This project supports coordination and development of a Watershed Management Plan and integration of that plan into the larger Source Water/Watershed planning effort, which is a component of the OTR Plan, and supports the existing TMDL (1994) and the goal of collaboration to achieve water quality improvements. The Project Area includes the Truckee River watershed in Washoe County. The **Watershed Coordinator** and **Technical Assistance Subcontractor** will coordinate closely with NDEP and identified stakeholders to complete portions of the Watershed Management Plan that are coordinated, consistent with and complimentary to the Source Water/Watershed planning process. The plan is developed and is going to local, state and EPA for approval.

Project Outcomes:

- *Comprehensive Source Water/ Watershed Management Plan*
- *Web-based planning tools*
- *Local and EPA Approval*
- *List of implementable projects for water quality*

Fiscal Summary:	**18-017**	**19-028**
319(h) funds	$99,870.00	$75,000
Non-federal match generated	$99,660.99	$75,000

Related Project Weblinks: onetruckeeriver.org

Project Status: Ongoing. Contract expirations 12/19 and 6/20

Cover of OTR Plan and Original Stakeholder Group

Watershed Literacy Implementation – Phase 3

Carson Water Subconservancy District *DEP #S17-021*

Project Partners:

University of Nevada Cooperative Extension
River Wranglers, The Nature Conservancy
Carson Valley Conservation District
Dayton Valley Conservation District
Lahontan and Stillwater Conservation District
Alpine Watershed Group, Carson City
Washoe Tribe, NDOT

Project Location:

Carson River Watershed:
Douglas, Lyon, Storey, Churchill County,
Carson City County and Alpine County, CA

Project Goals:

- ✓ Implement suggested actions from the Watershed-Literacy Action Plan (2015).
  - Determine how existing programs address main messages and reach target audiences.
  - Create new and/or modify existing messages and programs. Develop new partnerships that will enhance existing programs and fill identified gaps in survey analysis.
  - Conduct a watershed-wide media campaign.
  - Implement on-line interactive Stewardship Pledge.
- ✓ Develop a "Healthy Watershed Campaign" that targets action-oriented, message delivery methods.
- ✓ Create Geomorphology presentation to conduct outreach to elected officials and decision makers.
- ✓ Expand / enhance outreach tools. Include Spanish version of Interactive Online Watershed Map.
- ✓ Create two Watershed Outreach Videos

Project Summary:

The Watershed-Literacy Survey (2015) provided baseline information about watershed resident's knowledge allowing CWSD to target EE efforts. The Watershed-Literacy Program aims to increase the community's knowledge of watershed issues and encourage actions that reduce NPS pollution; ultimately leading to water quality improvements. The program undertakes several education outreach efforts to implement the Watershed-Literacy Action Plan and conduct follow-up actions. CWSD will contract with a Marketing Firm and work with EE implementers to develop and initiate a watershed wide Healthy Watershed Campaign. Other tasks include hiring a contractor to develop and present a Geomorphology presentation for Public Officials and decision makers; create an interactive on-line Spanish version of the Watershed Map, and update two "Get on the Bus Tour" videos.

Project Outcomes:

- *Walk Through the Watershed video completed. Logo created and distributed.*
- *"I am Carson River Watershed" campaign initiated in English and Spanish in November 2019.*
- *Iamcarsonriver.org created.*

Fiscal Summary:

319(h) funds	$126,905.45
Non-federal match funds	$128,844.03

Project Status: Complete. Contract expired 12/31/19

Project WET and Discover a Watershed Development Workshops

Get Outdoors Nevada #20-028

Project Partners:
National Park Service
Bureau of Reclamation

Project Location:
Southern Nevada: Las Vegas Wash

Project Goals:

- ✓ *Provide Project WET and Discover a Watershed professional workshops to southern Nevada teachers*
- ✓ *Teachers will then be equipped to demonstrate principles of Nevada's water resources to students*

Project Summary:

Get Oudoors Nevada will provide professional development education to Southern Nevada teachers through hands-on activities utilizing Project WET and Discover a Watershed.

Project Outcomes:

- Six water education workshops for 50 teachers who will receive professional development credits
- Provide support to teachers with resources and expertise related to water education so they may in turn educate their students

Fiscal Summary:

319(h) funds	$18,084.00
319(h) expended	$12,934.81
319(h) remaining	$ 5,149.19
Nonfederal match to date	$3,576.54

Related Project Weblinks: www.getoutdoorsnevada.org

Project Status:

Subgrant expires 6/30/21

GET OUTDOORS NEVADA

Watershed Education Initiative

Sierra Nevada Journeys #19-029/20-055

Project Partners:

Washoe County School District
Douglas County School District
Nevada Department of Wildlife
The Nature Conservancy
Project WET
Project Learning Tree
The Sierra Health Foundation
Truckee River Fund
Nevada Division of Forestry

Project Location:

Northern Nevada: Truckee and Carson Watersheds

Project Goals:

- ✓ *Provide engaging watershed education programs to 5,483 students and 198 educators*
- ✓ *Increase students' sense of stewardship and help reduce nonpoint source pollution*

Project Summary:

Sierra Nevada Journeys' (SNJ) Watershed Education Initiative (over two consecutive subgrants) connected 4,483 students with their local watershed, providing a sense of ownership and stewardship for the health of the Watershed. Field-based lessons were integrated with classroom lessons to maximize the impact of field experiences for the students. The framework of classroom and experiential learning is unique to the region and provides a transformative educational experience – building higher-order critical thinking skills while aligning to state and national science educational standards. Our program assessments are externally evaluated and show that 88-92% of participating students demonstrate increased comprehension of related state science standards.

Project Outcomes:

- 5,483 students and 198 educators participated
- 80% of students were able to correctly identify, label, and diagram a Watershed.
- 80% of students were able to define what happens to rain water, and associated non-point source pollutants, after they enter a storm drain.
- 70% of students were be able to use knowledge of storm drains to describe how individuals and communities can protect watersheds.
- 530 volunteers engaged with Sierra Nevada Journeys' Watershed Education Initiative.

Fiscal Summary:

319(h) funds	$173,530.00	Related Project Weblinks:
Non-federal match funds	$173,590.00	www.sierranevadajourneys.org

Project Status: Subgrant 19-029 closed 12/31/19. 20-055 complete 6/30/20.

Clark County NPS Pollution Prevention Education Program, 2020

Clark County Water Reclamation District

Project Partners:

Las Vegas Wash Coordination Committee

Project Location: ★

Colorado River Region

Las Vegas Wash, Clark County

Project Goals:

- ✓ *Provide educational awareness to citizens of Clark County about NPS Pollution*
- ✓ *To encourage behavioral change*
- ✓ *To provide information about stormwater management to residents and business owners*

Project Summary:

This project continues previously NPS grant funded efforts to educate residents and business owners about NPS Pollution and stormwater management. It includes further development and implementation of presentations, workshops, educational material, and advertising material that builds on the "Only Rain in the Storm Drain" message.

Project Outcomes to Date:

- ✓ *Outreach workshops and presentations to be scheduled*
- ✓ *Placement of additional Outreach Kiosks demonstrating stormwater management methods for various land uses.*
- ✓ *Purchase of "Only Rain in the Storm Drain" Take-Home items to be distributed during workshops and presentations*
- ✓ *Translation of Nonpoint Source Pollution information pamphlets from English to Spanish*

Fiscal Summary:

319(h) funds	$47,000.00
Non-federal match funds	$47,000.00
Total Project Cost	$94,000.00

Related Project Weblinks:
https://www.cleanwaterteam.com/Pages/default.aspx

Project Status: Started

BMP Manuals and NPS Outreach Materials produced by Clark County Water Reclamation District.
Photo Credit: Jon Paul Kiel

Initiatives to Reduce NPS Pollution in Southern Nevada, 2020

Southern Nevada Water Authority

Project Partners:

Clark County Flood Control District

Project Location: ★

Colorado River Region

Las Vegas Wash, Clark County

Project Goals:

- ✓ *Reduce sediment and nutrient loadings to the Las Vegas Wash*
- ✓ *Improve floodplain habitat*
- ✓ *Increased knowledge about nonpoint source pollution*

Project Summary:

This project continues previously NPS grant funded efforts to implement objectives of the Las Vegas Wash Comprehensive Adaptive Management Plan which includes revegetation, erosion control, water quality improvement and public education and outreach efforts. Replacing invasive weeds with native vegetation on the wash's floodplain is a major component of this project. The 37th and 38th Green-Up Event will take place under this grant. The project also includes magnet school field trips, and a stormwater poster contest for elementary students.

Project Outcomes:

- ✓ *Up to 20 acres to be planted with 15,000+ native trees and shrubs over two events.*
- ✓ *300-600 volunteers are expected to participate in each Green-Up Event.*

Fiscal Summary:

319(h) funds	$39,950.00
Non-federal match funds	$55,273.00
Total Project Cost	$95,223.00

Related Project Weblinks:
https://www.snwa.com/

Project Status: Started

A Mabel Hoggard Magnet School student tests the pH level of a water sample. Photo Credit: SNWA

Truckee Meadows Nature Study Area, Phase I

Truckee Meadows Parks Foundation #20-029

Project Partners:

City of Reno Parks

Community Foundation of Western Nevada

Project Location:

Northern Nevada: Truckee Watershed

Project Goals:

- ✓ *Restore TMNSA to wetland, riparian and natural upland system*
- ✓ *Create educational and recreational activities in a natural ecology with a learning outdoor laboratory*

Project Summary:

During phase 1, restoration activities will remove undesirable invasive species while concurrently revegetating with native plant species. Access for educational and recreational purposes will be improved. Educational events and volunteer activities will be held.

Project Outcomes:

- 12,000 linear feet of river corridor revegetated with native species
- 40 acres of habitat restored
- Interpretive signage will be installed
- 500 community members will be reached through events.

Fiscal Summary:

319(h) funds	$30,000.00
319(h) expended	$ 7,289.96
319(h) remaining	$22,710.04
Nonfederal match to date	$159,223.95

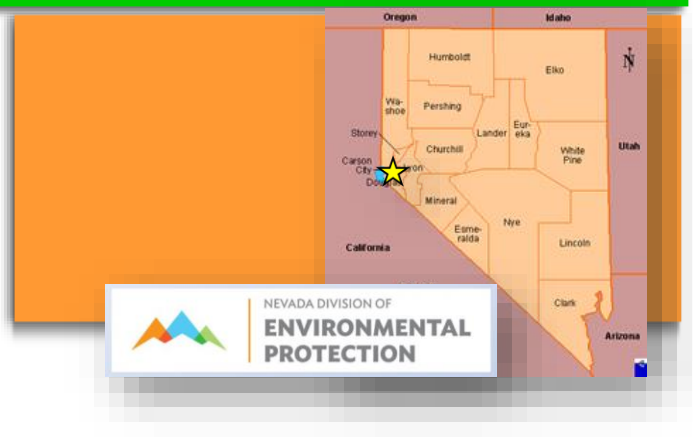
Project Status:

Subgrant expires 12/31/20

Related Project Weblinks: www.tmparksfoundation.org

Incline Creek Restoration Project above State Route 28

Incline Village General Improvement District (IVGID)



Project Partners:
Nevada Division of State Lands
Tahoe Regional Planning Agency
US Army Corps of Engineers

Project Location: ☆
Lake Tahoe Basin, Nevada

Project Goals:

✓ *Reduce bank erosion of Incline Creek and restore hydraulic function by stabilizing banks and replacing undersized culverts with open bottom bridge.*
✓ *Restore stream environment zone, improve fish passage and wildlife habitat.*
✓ *Reduce fine sediment load reaching Lake Tahoe per Lake Tahoe TMDL.*

Project Summary:

IVGID will manage the project's design, specifications, permitting, bidding, construction and inspection. The goal is restore stream channel stability, channel conditions for fish passage, continuity of riparian corridor, and water quality. Measures include rock stabilization and regrading for rock step pools; replacement of existing CMPs with an open channel bridge; and revegetation. The subwatershed is now a developed urban area with higher rates of stormwater runoff. Channel bed enhancement and restored connectivity to up and downstream reaches will improve habitat for fishes, wildlife, and extent and diversity of SEZ vegetation. Increased stability of the channel will reduce erosion and improve water quality. The project will reduce fines sediment production and sequester nutrients, benefitting Lake Tahoe TMDL objectives.

Project Progress

✓ *Construction completed fall of 2019.*

Fiscal Summary:

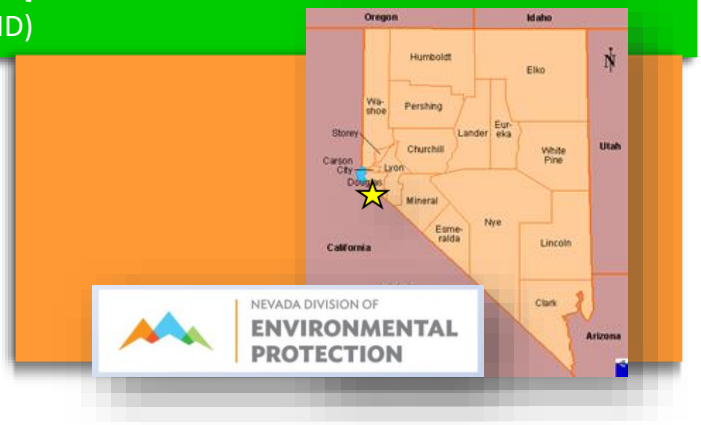
319(h) funds	$179,000
Non-federal match funds	$258,185
Total Project Cost	$437,185

Project Status: Complete

Project Web-links:
https://laketahoeinfo.org/Project/Detail/303

Kingsbury GID Street Sweeping Operations

Kingsbury General Improvement District (GID)



Project Partners:
Douglas County

Project Location: ★
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Research, test, select and purchase an appropriate high performance sweeper*
- ✓ *Provide updated procedures and a sweeping schedule to Douglas County to update the Road Operations (ROP) associated with the KGID road registration*
- ✓ *Operate and maintain the new sweeper according to ROP protocols and procedures, and make appropriate protocol adjustments to optimize reduction of FSP in urban stormwater runoff to Lake Tahoe*
- ✓ *Provide support to Douglas County for the purposes of assessing and reporting sweeping activities and effectiveness*

Project Summary:

Kingsbury General Improvement District (KGID) will purchase a high efficiency street sweeper for use on GID-maintained roads within its boundary. A high efficiency street sweeper is a mobile BMP (best management practice) used to remove sediment and other pollutants accumulated on roads. The effect is to reduce loadings of pollutants of concern in stormwater runoff and improve the clarity of Lake Tahoe.

Project Progress

- ✓ *Over the course of the 2019 summer KGID researched and tested three high performance sweepers from different manufacturers: Tennant, Schwarz, and Tymco*
- ✓ *A Tymco Model 600 (pictured) regenerative air sweeper delivered late December 2019*
- ✓ *Sweeping activities during winter and spring of 2020 recovered 200 yds^3 of debris from 1089 miles of road.*

Fiscal Summary:

319(h) funds	$155,000
Non-federal match funds	$287,769
Total Project Cost	$442,769

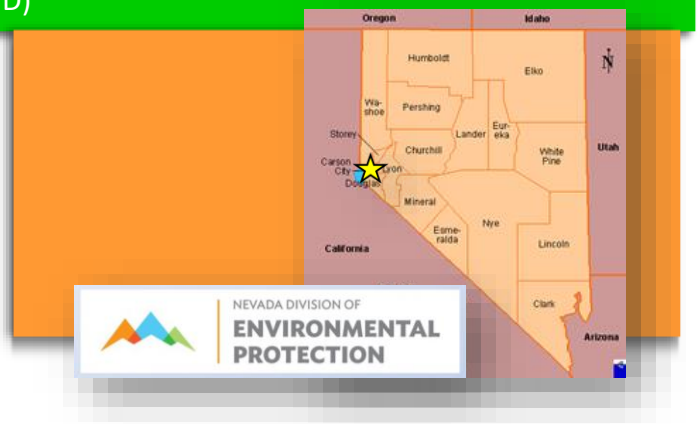
Project Status: Ongoing

Related Project Web-links

https://stormwater.laketahoeinfo.org/RoadRegistration/Detail/3

Kingsbury GID Bulk Material Spreader and Brine Maker Purchase

Kingsbury General Improvement District (GID)



Project Partners:
Douglas County

Project Location: ★
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Improve clarity of Lake Tahoe implementing TMDL pollutant controls.*
- ✓ *Reduce fine sediment load reaching Lake Tahoe from urban roads.*
- ✓ *Track sand and salt applied to assess pollutant source control effectiveness.*

Project Summary:

Kingsbury GID in 2015 purchased a new Epoke bulk material (brine, salt and sand) spreader and brine maker with 319 grant funds. First use of the equipment occurred in March, 2016. Compared to old equipment, the S4900 AST Combi spreader can more effectively and consistently apply sand, and, adds pre-wetted sand/salt, or brine solution capability for anti- and de-icing. The GID predicts the "best available technology" equipment and operations strategy will lower by 30% annual volume of sand applied. A major source of clarity-impairing fine sediment is pulverization of sand applied for winter road operations. As modeled for the TMDL, urban runoff carries 72% of fine sediment and 47% of total phosphorus entering Lake Tahoe.

Project Progress

- ✓ *KGID continues to operate the Epoke Spreader and Brine Maker to reduce abrasive application with application of brine.*
- ✓ *Pollutant load reductions quantified using Lake Clarity Crediting Program's Pollutant Load Reduction Model estimate load reductions of 412, 2, and 1 lbs/yr of fine sediment, total nitrogen and total phosphorous, respectively. Values assume 30% of pollutant load reductions associated with implementation of road operations using advanced equipment are attributed to source control activities (spreaders) and 70% attributed to recovery (sweepers).*
- ✓ *KGID will retain and continue to operate the Epoke Spreader consistent with federal guidelines.*

Fiscal Summary:

319(h) funds	$144,000
Non-federal match funds	$144,375
Total Project Cost	$288,375

Project Status: Closed

Related Project Web-links
https://stormwater.laketahoeinfo.org/RoadRegistration/Detail/3

Lower Wood Creek Phase I Water Quality Improvement Project

Washoe County Community Service

Project Partners:

Nevada Division of State Lands
Tahoe Regional Planning Agency
Nevada Department of Transportation
Incline Village General Improvement District
Nevada Tahoe Conservation District
Nichols Consulting Engineers

Project Location: ★

Lake Tahoe Basin, Nevada

Project Goals:

✓ *Implement the Lake Tahoe TMDL by planning, designing and constructing capital improvements that prevent stormwater pollution from entering the lake.*

✓ *Provide for public safety by designing a project that has no adverse effects on public safety.*

Project Summary:

Lower Wood Creek contributes a relatively high fine sediment particle load from directly connected catchments to Lake Tahoe. Notable water quality concerns within the project area include unprotected and erodible road shoulders that experience heavy parking pressure; bare earth ditches that serve as the primary drainage conveyance; and Wood Creek culverts with limited ability to convey greater than the average annual creek flow. This project will address each of these concerns to reduce fine sediment particle loads in stormwater to Lower Wood Creek and improve infrastructure capacity to convey stormwater during high flow events.

Project Progress

✓ *Project reached 50% design plans July 2020*

Fiscal Summary:

319(h) funds	$200,000
Non-federal match funds	$undetermined
Total Project Cost	$2,707,000

Project Status: In progress

Project Web-links: https://eip.laketahoeinfo.org/Project/FactSheet/01.01.01.0111

Washoe County Lake Clarity Crediting Program Implementation

Nevada Tahoe Conservation District

Project Partners:
Washoe County
Northwest Hydraulic Consultants

Project Location: ★
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Register Washoe County priority pollutant controls in the Stormwater Tools system on LT Info to meet NDEP Interlocal Agreement obligations.*
- ✓ *Conduct Pollutant Load Reduction Model (PLRM) modeling to estimate load reductions expected from implemented pollutant controls.*
- ✓ *Perform inspections to assess and report the condition of key and essential pollutant controls.*

Project Summary:

This is a continuation project to assist Washoe County to fulfill obligations and commitments contained in the Interlocal Agreement (ILA) to Implement the Lake Tahoe Total Maximum Daily Load (TMDL) with the Nevada Division of Environmental Protection (NDEP). The Nevada Tahoe Conservation District (NTCD) will work closely with Washoe County and NDEP to implement technical elements of the Lake Clarity Crediting Program and document attainment of load reduction milestones and associated credit targets contained in the ILA. Specifically, pollutant controls identified in the jurisdictions' load reduction plans will be registered and inspected using the updated suite of stormwater tools.

Project Progress

- ✓ *Since project inception, ten registrations have been registered within the Stormwater Tools for a total of 268 credits secured by end of water year 2019. Three registrations for 59 additional credits are pending approval.*
- ✓ *NTCD participated in the Stormwater Tools Phase 3 Improvements project and provided an initial review of an internal draft of a new Stormwater Tools Reference Manual.*

Fiscal Summary:

	old contract	new contract (2/20)
319(h) funds	$ 45,911	$ 39,229
Non-federal match funds	$ 75,911	$ 56,617
Total Project Cost	$121,822	$ 92,846

Project Status: Ongoing

Project Web-links:
https://stormwater.laketahoeinfo.org/Registration/Index

Nevada Department of Transportation Bulk Material Spreaders

(NDOT)

Project Partners:
None

Project Location: ★
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Improve clarity of Lake Tahoe implementing TMDL pollutant controls.*
- ✓ *Reduce fine sediment load reaching Lake Tahoe from urban roads.*
- ✓ *Track amount of material applied and O&M activities and cost to assess effectiveness.*

Project Summary:

NDOT purchased one BAT bulk material spreader with 319 grant funds and paid for a second with NDOT funds. First use of the Epoke 4902 occurred March 2016. The Epoke 4902 improves the efficiency and effectiveness of the application of pre-wetted salt, brine solution (deicing and anti-icing), and salt/sand. The new spreaders are used on heavily traveled highways SR 431 and US 50 in the Lake Tahoe Basin. NDOT predicts the Epoke spreader will lower by 15% the annual volume of bulk abrasive applied. A major source of clarity-impairing fine sediment is traffic-pulverized sand applied for winter travel. As modeled for the TMDL, urban stormwater runoff contributes 72% of fine sediment and 47% of total phosphorus loads entering Lake Tahoe.

Project Progress

- ✓ Pollutant load reductions quantified using Lake Clarity Crediting Program's Pollutant Load Reduction Model estimate load reductions of 10,877, 31, and 21 lbs/yr of fine sediment, total nitrogen and total phosphorous, respectively. Values assume 30% of pollutant load reductions associated with implementation of road operations using advanced equipment are attributed to source control activities (spreaders) and 70% attributed to recovery (sweepers)
- ✓ Contract closed September 2019. NDOT intends to continue using the spreader consistent with federal guidelines.

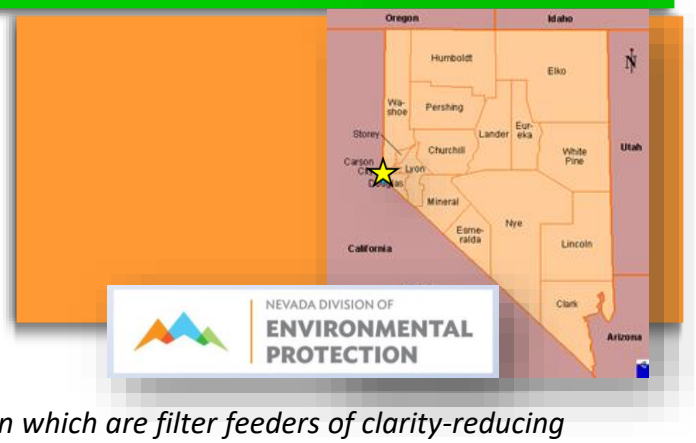
Fiscal Summary:

319(h) funds	$100,000
Non-federal match funds	$316,150
Total Project Cost	$416,150

Project Status: Closed

Control of the Invasive Mysis Shrimp to Recover Lake Clarity

University of California Davis Tahoe Environmental Research Center (UCD TERC)



Project Partners:
California Tahoe Conservancy

Project Location:
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Reduce levels of the introduced Mysis shrimp to levels that allow reestablishment on native zooplankton which are filter feeders of clarity-reducing phytoplankton and fine particles.*
- ✓ *Pilot Mysis shrimp removal techniques and rates in Emerald Bay and evaluate lake response.*
- ✓ *Evaluate feasibility of method application to Lake Tahoe and develop lake-wide harvest plan.*

Project Summary:

Intensive monitoring conducted by the UC Davis Tahoe Environmental Research Center (TERC) over the last five years has revealed a direct linkage between Mysis shrimp and lake clarity in Emerald Bay. This project will plan, test and optimize a "top down" strategy to improve water clarity in Lake Tahoe by reducing the abundance of Mysis shrimp, which would in turn allow the recovery of native Daphnia and Bosmina zooplankton species, whose higher grazing rates have now been shown to drastically improve water clarity. The results will be used to develop a Mysis reduction plan and a strategy for Lake Tahoe, the implementation of which could drastically shorten the time to achieving lake clarity restoration, compared to the present estimates that are based on implementation of the TMDL recommended strategy alone.

Project Progress

- ✓ *Baseline evaluation criteria have been established for demonstrating changes in Emerald Bay's ecology and water quality, based on mysid removal efforts*
- ✓ *Enumeration of mysid densities & behavioral patterns in Emerald Bay and Tahoe*
- ✓ *Developed and piloted mysid removal techniques*
- ✓ *A draft project report has been produced and is in process of being peer reviewed.*

Fiscal Summary:

319(h) funds	$ 59,999
Non-federal match funds	$532,609
Total Project Cost	$592,608

Project Status: Ongoing

Project Web-links: https://tahoe.ucdavis.edu/mysid

TRPA Parcel BMP Assistance

Tahoe Regional Planning Agency

Partners:
Washoe County
Douglas County

Project Location: ★
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Improve clarity of Lake Tahoe implementing parcel BMPs as pollutant controls.*
- ✓ *Reduce fine sediment load reaching Lake Tahoe from urban development.*
- ✓ *Track parcel BMP implementation and maintenance to assess ongoing load reduction.*

Project Summary:

TRPA and NDEP coordinate to achieve co-objectives of the TRPA Environmental Improvement Program and NDEP's Lake Tahoe TMDL. The TRPA Parcel BMP Program and Lake Clarity Crediting Program focus on reducing clarity-diminishing urban stormwater and pollutant loads. TRPA estimates 3,770 Nevada parcels do not have BMP certificates and 8,222 do. Maintenance outreach is needed on higher loading land use parcels. The grant partly supports the Stormwater Management Program (SMP) which facilitates installation and maintenance of parcel BMPs. The SMP provides BMP planning, design, permitting, and maintenance guidance and water quality information to hundreds of residents and visitors. TRPA focuses BMP implementation in County-identified fine sediment reduction priority areas and provides parcel level BMP status data used to estimate pollutant load reductions for the TMDL.

Project Progress

- ✓ Parcel BMP program continues to coordinate with Washoe and Douglas Counties for TMDL implementation.
- ✓ Current total pollutant load reductions since the start of the project are 2,580 tons per year of TSS, 57 tons per year of total nitrogen, and 15 tons per year of total phosphorus.

Fiscal Summary:

319(h) funds	$184,502
Non-federal match funds	$184,503
Total Project funds	$369,005

Project Status: Ongoing

Related Project Web-links
http://www.tahoebmp.org/bmpresources.aspx

Pilot Project to Reduce Sourcewater Plastic Pollution at Lake Tahoe

Incline Village GID

Project Partners:

Tahoe Water Suppliers Association
UC Davis TERC
Sierra Watershed Education Partnerships
Incline High School

Project Location: ★

Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Raise public awareness of plastic pollution in the environment and the impacts of consumer choices*
- ✓ *Reduce the presence of plastic in Lake Tahoe and on beaches through reduction of single-use plastics*

Project Summary:

The presence of microplastics in Lake Tahoe's waters and on its beaches has been confirmed. With no commercial fishing, shipping, or wastewater discharges permitted to Lake Tahoe, conventional sources of microplastic in the lake are presumed to be litter from single-use items improperly disposed of in and around the lake. This project seeks to provide a solution to plastic pollution stemming from single use plastics through a through a multifaceted behavioral-change approach involving market and scientific research, public outreach and education, and local business partnerships.

Project Progress

- ✓ *Messaging and graphics for outreach in litter prevention have been developed through collaboration with Drink Tahoe Tap and Take Care Tahoe*
- ✓ *Klean Kanteen co-branding partnership with the Incline Village Raley's is underway*
- ✓ *Local students have conducted research to help develop a public outreach exhibit which is fully built and available for public education when appropriate*
- ✓ *Take Care Tahoe campaign website launched (linked below)*

Fiscal Summary:

319(h) funds	$ 61,995
Non-federal match funds	$ 78,200
Total Project Cost	$140,195

Project Status: In progress

Project Web-links: https://takecaretahoe.org/drink-tahoe-tap/

Reclaiming Tahoe's Lakebed: A SCUBA-enabled underwater litter clean up in Lake Tahoe

Clean Up The Cayes

Project Partners:
Nevada Division of Environmental Protection
Nevada Division of State Lands
Desert Research Institute

Project Location: ★
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Recover litter from six one-mile sections of Nevada's Lake Tahoe's nearshore lakebed*
- ✓ *Assess the type, usage category, location, amount, and weight of all recovered litter*

Project Summary:

Clean up The Cayes and its dive partners will remove nearshore litter during six separate one-day cleanup dives. Each dive will cover approximately 1 mile of nearshore terrain enlisting between 6 to 8 divers and 3 surface support personnel. Project leaders will partake in each dive as the core, underwater logistics team, which includes scouting the nearshore lakebed and directing the dive team's efforts towards zones characterized by high litter accumulation. They will also geolocate large, heavy items for retrieval in a later clean up phase. The remaining divers will work in pairs to collect small to medium sized (e.g. items < 20 lbs.) litter in dive bags and employ a range of methodologies to bring collected litter to the surface for removal from the lake for subsequent analysis and reporting.

Project Progress

- ✓ *COVID-19 related delays pushed back contract execution to end of FFY20*
- ✓ *Dive plan documentation developed*
- ✓ *Efforts to enlist and train dive volunteers conducted*

Fiscal Summary:

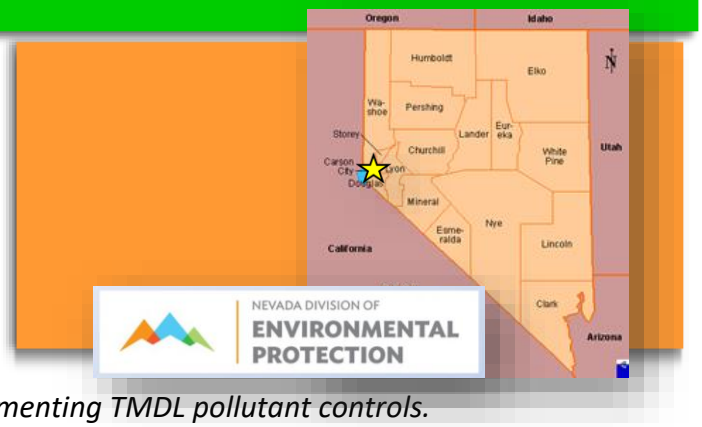
EPA funds	$ 15,000
Non-federal match funds	$ 49,717
Total Project Cost	$ 64,717

Project Status: In progress

Project Web-links: https://cleanupthelake.org/

Washoe County Street Sweeper Purchase and Operation

Washoe County Community Services



Project Partners:
none

Project Location:
Lake Tahoe Basin, Nevada

Project Goals:

- ✓ *Improve clarity of Lake Tahoe implementing TMDL pollutant controls.*
- ✓ *Reduce fine sediment load reaching Lake Tahoe from urban roads.*
- ✓ *Track material collected and miles swept to assess relative sweeper effectiveness.*

Project Summary:

Washoe County put the high performance, vacuum-assisted sweeper into service in 2013. The primary purpose of the Tennant Sentinel is to remove sediment accumulated on roads and pedestrian paths, particularly during winter and spring, before runoff conveys it to Lake Tahoe. The Tennant sweeper is one of three sweepers in the county's Road Operations Plan, removing approximately 16% of the total sediment swept up in Incline Village and Crystal Bay. A major source of clarity-impairing fine sediment is pulverization of sand spread on icy or snow-covered roads. As modeled for the TMDL, urban stormwater runoff carries 72% of fine sediment and 47% of total phosphorus entering Lake Tahoe.

Project Progress

- ✓ *Washoe County continues to operate the sweeper.*
- ✓ *Pollutant load reductions are estimated at 9736, 41, and 23 lbs/yr assuming assume 30% of pollutant load reductions associated with implementation of road operations using advanced equipment are attributed to source control activities (spreaders) and 70% attributed to recovery (sweepers).*
- ✓ *Washoe County has achieved match requirements, fulfilling grant obligations, but will continue to operate the sweeper consistent with federal guidelines.*

Fiscal Summary:

319(h) funds	$200,000
Non-federal match funds	$253,335
Total Project Cost	$453,335

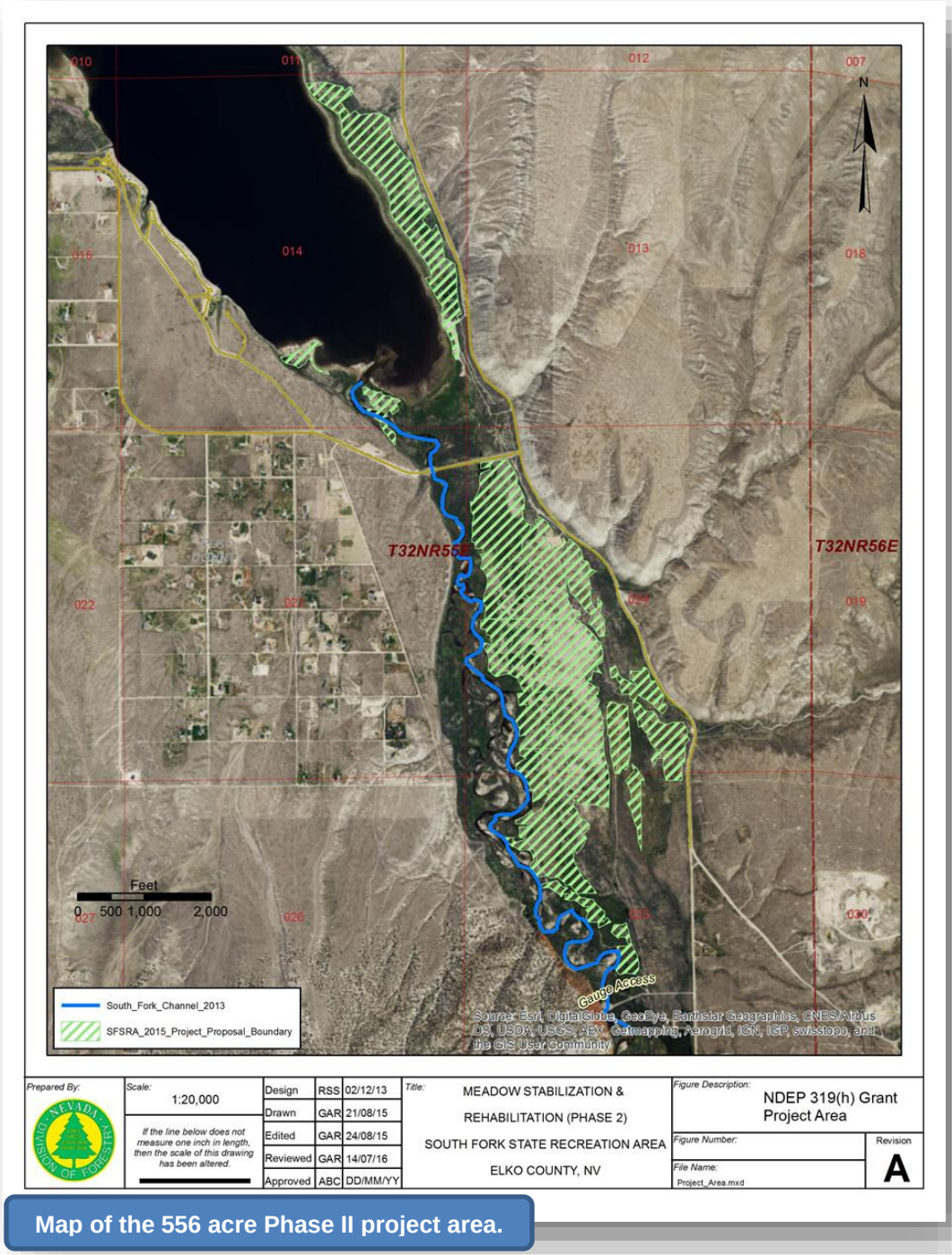
Project Status: Completed

Related Project Web-links

https://stormwater.laketahoeinfo.org/RoadRegistration/Detail/2

Appendix D: Annual Success Story

South Fork River Stabilization and Meadow Rehabilitation: A Multi-Year Progressive Success Story



Map of the 556 acre Phase II project area.

In October 2015, the Nevada Division of Forestry (NDF) was awarded a second 319(h) grant that allowed for continuation and expansion of project work at South Fork State Recreation Area in Elko County, Nevada. Phase I included three seasons of field work focusing on invasive weed treatments within the most impacted meadow areas upstream of South Fork Reservoir. Phase II grant fieldwork using matching funds began on October 15, 2015, with final grant approval for Phase II tasks occurring on January 14, 2016. Project implementation continued through Dec. 31, 2019.

This project directly addressed water quality parameters in three miles of the South Fork of the Humboldt River and the South Fork Reservoir. The goal of the project was to improve water quality entering and leaving the reservoir which eventually enters the Humboldt River, which is listed as Impaired under CWA Section 303(d). To improve water quality, 319(h) grant funded project elements focused on the following goals:

- *Control of noxious and invasive weeds which had invaded abandoned irrigated hay meadows at the time of state purchase of the land in 1987.*
- *Reseed the meadows with native and introduced grasses, in order to control erosion occurring on denuded lands.*
- *Utilizing tree and shrub plantings, stabilize eroding streambanks along the South Fork of the Humboldt River, where it meanders for 3 miles through the meadows.*
- *Augment beaver dams along the river by caching aspen branches that the beavers could use for dam construction.*
- *Monitor, manage, and maintain the treatment areas for goal attainment and maintenance needs.*

The primary management techniques in which these goals were attained with 319(h) funds included the following: broadcast and drill seeding; outplanting of trees and large shrubs in protective cages; transporting aspen cuttings from an offsite hazardous fuels reduction project; herbiciding by boom, wand and cut stump application, and utilizing repeat photography to photomonitor establishment of beneficial vegetation. Matching funds from a wide variety of community organizations helped ensure success of these management techniques. They also allowed for a broader ecosystem-wide remediation and restoration project. Additional management techniques funded by match money included soil testing and soil health improvement through organic fertilization, shrub plantings and sagebrush caching, equipment repair and replacement, and soil erosion control.

While there remain areas which have incomplete weed control or sparse cover of grasses, the bulk of the 566 acre restoration project has been deemed a success by project collaborators. It serves as a testament to how adaptive management can keep a project moving forward through periods of bad weather, flooding, equipment breakdowns, personnel shortages, and fiscal challenges. And it is a model of the multiplier effect of successful collaborations among state government agencies, non-profit conservation organizations and business, especially through mining company grants addressing social responsibility commitments to the communities they reside in.

Photo Monitoring Point
SFSRA PP04a

July 26, 2010

June 5, 2015

Rephotography on June 16, 2019 of photo monitoring point SFSRA PP04a. This ten-year chronosequence shows the annual reductions in noxious and invasive weeds from herbiciding and the annual increases in beneficial perennial grasses from seeding.

By leveraging 319(h) grant funds 8:1, there was the opportunity to test and demonstrate a variety of experimental conservation practices to insure or enhance the grant deliverables of increasing cover of desirable vegetation, reducing erosion, and raising water tables. The project effectively evolved into a Nevada Division of Forestry restoration demonstration area. For example, remediating poor soil health became an adaptive management strategy necessary to get out of a cycle of repeated failed seeding of barrens. For instance, 319(h) funds were specifically used to experimentally encourage dam establishment by beavers, by supplementing aspen tree branches necessary for dam construction. The woody material was absent from their dam building sites, so the beavers were assisted by human caching of aspen branches cut from an offsite fuel reduction project. Matching funds from additional project partners allowed for enhancing other 319(h) funded conservation practices. The Nevada Department of Agriculture supplemented Humboldt Watershed Cooperative Weed Management Area (HWCWMA) and Nevada Division of Environmental Protection (NDEP) 319(h) funded chemical control of weeds, by providing biocontrol insects for weed control. Additional practices were often necessary to ensure outplanting success. Nevada Gold Mines provided funding to support out-plantings of woody plants including organic soil amendments and fertilizers to ameliorate low biological activity, low nitrogen fixation and zinc deficiency in project area soils.

It became critical to indicate when and where plantings needed to be protected by wire cages. Willows and cottonwoods required them when near areas that beavers utilize. Rose and golden currant only needed them in areas near trails and fishing paths. Finally, it is important to note where and when plantings failed and what the lesson learned were from those adversities.

The protective caging to dozens of narrowleaf cottonwoods were inspected and repaired in the spring of 2016. These trees had been planted from 25-gallon pots with NDEP 319(h) grant funds in 2012. Repairs were made to cages on east side of river. About six east side trees had severely damaged cages and were heavily browsed by deer. An unknown number of the 2012 plantings had been washed away by floods, but at least a dozen were establishing below current bank-full elevation. Best tree establishment was seen in remnant channels of former meanders, where available water is close to the surface in summer.

Boy Scout Volunteers assist on an Eagle Scout Service Project, planting 30 trees with protective cages near the river kiosk. Photo taken on June 2, 2018, looking north.

Because of the heartiness of Wood's rose and golden current along streambanks, fifty Wood's rose and fifty golden current shrubs were purchased and planted in the fall of 2016 on streambanks lacking woody plants. Extended seasonal firefighters we again used to assist in planting them along eight pre-marked transects on riverbanks used by fisherman. Two-foot diameter protective caging was built around each shrub. Green ash seeds which had been collected the previous spring from NDF's Jordan Arboretum were hand sowed around each shrub planting. Unfortunately, no green ash seedlings have been seen since that seeding.

In the spring of 2017, the Project Manager began augmenting the labor force with volunteers. Three planting events were done between May 19th and 28th, totaling seven volunteers. The events taught planting and protective caging methods, with the volunteers planting in pre-approved "HWCWMA Tree Planting Areas." Twenty-five hybrid poplars, 10 golden currents and 12 Wood's rose were planted. Two foot diameter protective caging was placed around most of the new plantings. These plantings would be manually watered twice in the fall to promote establishment.

The spring of 2018 included the most productive out-planting activity in either Phase I or II of the project. NDF employees and inmate crews planted 210 woody plants and Eagle Scout project volunteers planted an additional 30, aided by $5,135 in project matching funds from Barrick Gold and the Rotary Club of Elko Desert Sunrise. These funds covered streambank and lakeshore stabilization plant materials, supplies and labor. These included 35 Pacific willows, 35 peachleaf willows, 65 narrow-leaf cottonwoods, 35 golden currents and 35 Wood's wild roses. The cottonwoods and Pacific and peachleaf willows were protectively caged. Thus, in a single season the "83 plants per year" deliverable was nearly reached. With a two year contract extension thereafter, the total out-plantings per year deliverable was reached over five years, with no additional 319(h) funds needed.

Approximately 125 spring 2018 planted and protectively caged plants received supplemental watering, weeding and mulching in the early summer of 2018. It was done as an educational activity for 18 teen and pre-teen students from the Nevada Outdoor School. They tended to the protectively caged trees near the river kiosk and a National Public Lands Day planting directly across the river. This was done with a collaboration of instructors and logistics support, including lunch, from the Humboldt Watershed Cooperative Weed Management Area, NDF and the Northeastern Nevada Stewardship Group. However, a cursory examination of some of those has showed mortality due to noxious weed invasion, rodent disturbance, and drought.

For the most part, woody out-plantings were not flooded by the spring runoff in 2019. Permanent photo-monitoring points were re-shot to show extent of revegetation after extremely favorable rainfall since January 1. On June 1st, rainfall at the SF SRA headquarters had totaled 12.75" in the previous five months, versus 9.75" per full year, on average. While assessing the success of the fall 2018 sagebrush carcass caching, it was found that the density of seedlings at many caches had surpassed that on any experimental plot in the pilot study elsewhere across northeastern Nevada. Sagebrush carcasses (dead sagebrush shrubs) are staked over depressions on bare ground and secured with wire mesh. The carcasses drop seed in the depression, that subsequently accumulates snow and eventually snowmelt moisture, enhancing germination of desirable vegetation.

Narrow-leaf cottonwood planting and willow pole staking site from the Sept 2012 National Public Lands Day event.
Photo taken on Sept. 29, 2012, view to NW. Site is not georeferenced, but is near planting transect photopoint P2E.

View on June 5, 2015. Note size of narrow-leaf cottonwoods, planted three years earlier in 25-gallon pot size.

Six years after planting, willows are establishing and the narrow-leaf cottonwoods have doubled in size in just three years. In the foreground are protective cages from May 2018 plantings by NDF seasonal firefighters. Photo taken July 23, 2018.

Beaver dam augmentation was attempted over the course of two winters. The following paragraphs put it into chronological perspective: The winter of 2015-16 was when fresh aspen cuttings were first cached in five areas along the South Fork of the Humboldt River. The caches were intended to encourage utilization of the branches by resident beaver for their dam construction. There is a dearth of unprotected live woody biomass along the river for dam construction. It was thought that supplementing the beavers with woody biomass from a hazardous fuels reduction project in Lamoille would encourage stronger dam construction.

Periodic evaluations were made of the five areas of cached aspen cuttings in the spring of 2016. No over-winter beaver dams held through a 2016 early spring runoff persisting at or above flood stage for over two months. Success of this experiment was inconclusive in 2016, due to no beaver activity being was seen in the previous fall and a lack of winter monitoring. Persistent winter snow made access to the river impractical without snowshoes, which NDF did not have.

On Feb. 19, 2017, beavers were observed to have utilized the bankside cache of branches left in the fall of 2016. They were augmenting existing, but uncompleted dams. Aspen sticks (a species not present on site) were observed in the remnants of a beaver dam slightly upstream. That 90% completed dam and a partial 25% dam nearest the cache had washed out to 10% or less by Feb. 19th and were non-functional. It was not known how extensive the dams had been prior to the Feb. 19th monitoring. A likely event which could have resulted in breaching the dams was a Feb. 7th rain on top of 10" of snow, which caused regional flooding. Unfortunately it wasn't possible to walk downstream on Feb. 19th, to monitor a difficult to access beaver dam. That dam might have been augmented by beavers following a stream flow carried cache done on Dec. 7, 2016, where branches were tossed in the river and allowed to flow downstream. That dam was fully spanned the river on Dec. 7th, thus the floated branches would have accumulated along the ace of the beaver dam.

Aspen branches from the cache, showing up in a new beaver dam. Photo taken February 19, 2017.

Project Challenges

Over the course of 8 seasons of project implementation, several project challenges presented themselves that had to be overcome. They included, but were not limited to the following:

- An ATV rollover accident in 2015 during Phase I field work prohibited further use of ATVs for boom spraying. This made application of herbicides in rough terrain difficult if not impossible.

- Unavailability of state employed agricultural equipment mechanics slowed equipment repairs. Equipment breakdowns were difficult to resolve quickly.

- Unfortunate timing of equipment breakdowns while seasonal support staff was available to work wasted staff time.

- Loss of seasonal support staff from both NDF and State Parks when personnel were dispatched to fire suppression duties prevented timely implementation of tasks.

Positive Project Outcomes

Despite the challenges noted above, persistent work season after season resulted in many positive outcomes, many unrelated to the scope of work supported by 319(h) grant funding. Meadows and wetlands on the South Fork River become a demonstration area to train people in resource management and especially wetland restoration techniques. Among those benefitting, the Nevada Outdoor School event tended to out-plantings. NDF intern Courtney Krantz gained experience in herbiciding, photomonitoring, as well as tending to tree plantings. NDF extended seasonal firefighters got their first experience in spraying fertilizers, use of rangeland drills, and tractors to move the equipment. Inmate crew supervisors were able to practice various conservation practices with 10 person crews.

Matching funds from collaborative partnerships addressed broader ecosystem restoration needs not previously considered. A soil health workshop sponsored by the Northeastern Elko Conservation District was attended by the Project Manager in the summer 2017. That workshop gestated an idea that to increase success of reseeding, a soil slurry needed to be designed which would restore soil biotic activity and improve nutrient availability. An additional $5,000 in match was solicited and awarded by Barrick Gold to complete chemical and biological tests of the soils north of the causeway, the uplands south of the causeway and in the bottomlands.

Cottonwood Ranch, which hosted the soils workshops, donated five gallons of oceanic hydrolysate for experimentation within the 319(h) grant project area to determine its value as an adjuvant for herbiciding. With limited funds available on the project for herbiciding chemicals, a positive result of the experimentation would give the dual advantage of the oily organic fertilizer improving soil health while also replacing the more expensive mentholated seed oil which was previously used as an adjuvant only. The experiment would prove successful, providing organic NPK fertilization to feed beneficial soil fungus and bacteria, at the same time as aiding herbicides in sticking to weed leaves.

In the Spring of 2017, the Project Manager co-led with Park Superintendent Robert Misiti, a field tour of the project area for newly appointed Nevada Department of Natural Resources administrators. This included DCNR Director Bradley Crowell, Deputy Director Dominique Etchegoyhen and then Acting State Forester Kacey KC (later permanent). Discussed within the project area were accomplishments and lessons learned to date, the latter which had immediate applicability to the pressing need for restoration of private land transfers which had just become the new Walker River State Recreation Area. Urgent was the need not to repeat the mistake in acquiring the SF SRA: failure to convert irrigated hayfields to a permanent cover not needing irrigation. This kind of administrative attention to a model restoration project undoubted helped keep the project high profile through Phase II. It also was a living demonstration of successful interdivisional collaboration within three large agencies* of the Nevada DCNR, a goal of the new Director.

*Division of Forestry, Division of State Parks, and Division of Environmental Protection.

With federal, state and community support, the Meadows and the southern shores of South Fork Reservoir have become a regionally prominent example of leaving the land and its water in better condition than it was at the start of Phase II and especially Phase I 319(h) grant funding. Furthermore, at a time when COVID-19 is putting a demand on dispersed public recreation opportunities, the Meadows is enjoying frequent use by the public looking to get grounded in being in nature and amongst wildlife.

Although the Phase II 319(h) grant contract expired on December 31, 2019, progressive restoration efforts continue to be implemented on the South Fork River project area.

Gary Reese, NDF Resource Management Officer and South Fork River Project Manager, plants Hoary aster seeds in sagebrush carcass caches along and near the Humboldt Trail. This experimental planting uses two-year-old sagebrush caches as beds for forb establishment. Photo taken April 4, 2020, near the road kiosk (Cache 15), as a COVID-19 social distancing activity.