

TRUCKEE REGIONAL AQUATIC INVASIVE SPECIES PREVENTION PROGRAM



01/31/2011

Truckee River Fund 2010 Final Report

Tahoe Resource Conservation District

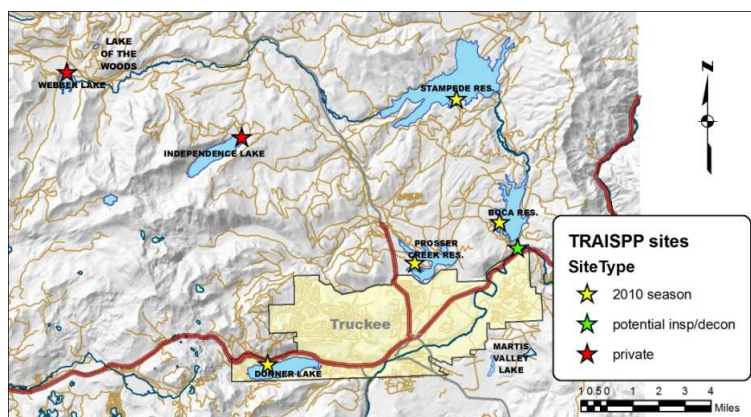
Craig Threshie, Kim Boyd, Dave Roberts

INTRODUCTION

The prevention and control of aquatic invasive species (AIS) continues to be one of the most challenging issues facing resource managers in the western United States. While state and federal officials have implemented control measures and programs on a broad scale, the implementation of programs to protect specific water bodies has primarily been left to local governments and resource managers. The discovery of quagga mussels in Lake Mead in January of 2007, and their subsequent spread into Southern California, has placed significant responsibilities on local agencies to determine how best to protect local water resources from potentially devastating infestations. While quagga mussels, and the closely related zebra mussel, have been in the Great Lakes since the late 1980's their relatively recent introduction and spread in western states has elevated the importance of aquatic invasive species in general and motivated many resource managers to also evaluate the risks associated with other invasive species. The potential spread of invasive species such as asian clam, Eurasian watermilfoil, New Zealand mudsnail, Hydrilla, and other mobilizing invasive species present their own resource and management concerns that are best addressed on a watershed scale. This is particularly true for AIS given their ability to travel through open water systems within a watershed.

In response to this increasing resource management concern, the Tahoe Resource Conservation District (Tahoe RCD) initiated a pilot AIS program in the Truckee region with funding provided by the Truckee River Fund. The principle objectives of the pilot program were to better understand invasive species issues in the region, provide outreach and education on invasive species, organize regional resource managers, evaluate usage patterns, and evaluate the feasibility of watercraft inspections and decontaminations. The eight water bodies included in the program are listed in Table 1 and identified on the regional map below.

Donner Lake	Stampede Reservoir
Independence Lake	Boca Reservoir
Webber Lake	Prosser Reservoir
Martis Creek Lake	Lake of the Woods



The Tahoe RCD hired a program coordinator and 6 seasonal watercraft inspectors to implement the program which was initiated in January 2010. The pilot program adopted the title Truckee Regional Aquatic Invasive Species Prevention Program (TRAISPP) in recognition of the principle focus of the pilot program. The initial season of the program was very successful and benefited from broad support amongst resource managers, county representatives, utility managers, and, importantly, boaters.

Coordination efforts have resulted in a formal Memorandum of Understanding and letters of support, as well as funding and in-kind contributions from partner agencies. The geographical scope of coordination has extended through the entire Truckee River watershed, from Lake Tahoe to Pyramid Lake. The degree of

coordination and cooperation among partner agencies underscores the importance and need for regional management efforts.

PROGRAM OBJECTIVES

As mentioned in the introduction, the principle objectives of the pilot program were to better understand invasive species issues in the region, provide outreach and education on invasive species, organize regional resource managers, evaluate usage patterns, and evaluate the feasibility of watercraft inspections and decontaminations. More specifically, the proposal submitted to the Truckee River Fund identified Project Goals and Measurable Outcomes which are presented in this section of the report. Compliment to these is a brief summary of accomplishments for each of the identified Project Goals and Measurable Outcomes. Greater detail is provided in the following sections of the report that specifically address many of the identified goals and outcomes.

Project Goals

- 1) *Guide implementation of AIS prevention measures through interagency, scientific, and stakeholder coordination in the headwaters of the Truckee River Watershed.*
Accomplishments: Coordination and outreach were principle efforts of the pilot program. Monthly stakeholder meetings were organized and complimented with numerous presentations to stakeholder groups and organizations. The following section of this report, Program Implementation, provides specific examples and details on agency coordination and program development.
- 2) *Gather baseline data on current AIS infestations in 3 selected reservoirs.*
Accomplishments: The University of Nevada Reno, California Department of Fish and Game, and U.S. Bureau of Reclamation assisted in the collection of baseline information from 12 regional water bodies including Stampede , Boca, and Prosser Reservoirs, as well as, Donner Lake. The information collected provided information on the presence and absence of invasive species and extensive water quality data and is summarized in a report from UNR submitted with this report.
- 3) *Complement and leverage existing Lake Tahoe AIS prevention, control and monitoring efforts to implement program on at-risk water bodies outside the Basin but within the headwaters of the Truckee River Watershed.*
Accomplishments: The experience of the Tahoe RCD with the establishment and implementation of the Lake Tahoe Watercraft Inspection Program were directly applied to this program. Extensive coordination and cooperation occurred between the Tahoe program including the use of the same inspection protocols, decontamination procedures and stations, boater surveys, and potential ordinance language.
- 4) *Combine the best available science with established AIS management to effectively control the proliferation and possible introduction of AIS in the upper Truckee River Watershed.*
Accomplishments: The establishment of baseline information combined with a greater understanding of usage patterns on water bodies was the first step towards the integration of the best available science and potential management strategies. Water quality and substrate information will provide a better understanding of the potential establishment of invasive species while a better understanding of water body usage allows more effective outreach and education efforts and the potential pathways for the introduction of invasive species.
- 5) *Develop multi-agency framework and process to expand watercraft inspection and decontamination stations in such a way to serve all water bodies in the California portion of the Truckee River Watershed.*
Accomplishments: The extensive coordination between agencies and programs provided for extensive interaction between AIS programs. In-kind contributions allowed for the use of decontamination stations

established for the Tahoe program. Watercraft inspection efforts identified potential locations for permanent decontamination facilities in Truckee and/or at the Hirshdale exit from highway 80 south of Truckee. Additionally, The Paiute Tribe is now initiating an inspection program for Pyramid Lake and local jurisdictions are considering ordinance language that would require watercraft inspections.

- 6) *Identify funding strategies to create a self-sustaining, long-term program.*

Accomplishments: Significant progress was made on identifying potential long term funding for program implementation including the need for a multi-party funding program which recognizes that no single entity is responsible for prevention and control of invasive species. However, before a specific funding strategy can be pursued it is important to identify what the goals and needs would be for a long-term program. This would include a greater understanding of both the risk of introduction and establishment of invasive species and the specific actions that would be acceptable based on these risks. This is a primary goal for the program in 2011.

- 7) *Develop an effective and comprehensive AIS Education and Outreach Program for the headwaters of the Truckee River Watershed.*

Accomplishments: The education and outreach effort was well-received and proved to be quite successful. Through public presentations, press coverage and boater surveys the program was generally accepted as community members and interest groups understood the value of protecting their valuable natural resources, recreational opportunities and economic interests.

Measurable Outcomes

- 1) *Organize and initiate programmatic discussions on regional AIS prevention and control for the headwaters of the Truckee River Watershed.*

Accomplishments: Extensive outreach efforts were initiated to organize a stakeholder group which met once a month to discuss programmatic issues and approaches. Additionally, efforts were made to meet with county supervisors, town officials, user groups, resource managers and other potentially interested parties. Numerous presentations were provided over the year and significant media coverage was provided.

- 2) *Implement pilot level Watercraft Inspection Program.*

Accomplishments: Six seasonal watercraft inspectors were hired in May and conducted inspections and outreach until September. Through a prioritization process, inspectors were assigned to water bodies that showed the greatest usage and potential for introduction of invasive species. A total of 7,436 interactions occurred between boaters and watercraft inspectors during this time primarily on Donner Lake and Stampede and Boca Reservoirs. A total of 15 watercraft were prevented from launching due to high risk status. No boats were found to contain quagga or zebra mussels.

- 3) *Aid in the prevention of future AIS invasions.*

Accomplishments: While difficult to measure directly, establishment of a Truckee Regional program, the presence of watercraft inspectors combined with extensive education and outreach efforts certainly contributed to this outcome.

- 4) *Provide a framework for discussions for possible development of MOUs and/or other necessary agreements between coordinating partners for the purpose of implementing a Watercraft Inspection Program.*

Accomplishments: This effort has resulted in 7 MOU signatories and 2 letters of support. Undoubtedly, as the program advances and more specific implementation objectives and needs are identified this number will continue to increase.

- 5) *Produce an inventory of currently existing AIS in 3 selected reservoirs in the headwaters of the Truckee River Watershed.*

Accomplishments: Through the efforts of the University of Nevada Reno (UNR), a total of 12 water bodies were evaluated for the presence of invasive species and water quality nutrients. Of the total, 7 water bodies are located in the Truckee region, 2 are in the Lake Tahoe Basin, and the 3 are in Nevada. Overall, the water bodies in the Truckee region are remarkably free from invasive species. Analysis of the data collected for the Truckee region showed that; 1) crayfish, which can be considered an invasive species, are present in most water bodies surveyed, 2) Eurasian watermillfoil was present only in Martis Creek Lake and 3) Asian clam was confirmed to be present in Donner Lake and possibly Martis Creek Lake. Greater detail is provided in the Water body Characteristics section and accompanying report by UNR.

- 6) *Increase public understanding, perception and awareness of watercraft inspections and AIS and their associated risk to the watershed and surrounding communities.*

Accomplishments: While also difficult to measure directly, the 7,436 interactions with boaters, monthly stakeholder meetings, numerous presentations and extensive media coverage certainly contributed to this outcome.

- 7) *Assist in the development of a multi-party funding strategy to sustain prevention and control efforts.*

Accomplishments: Before a specific funding strategy can be pursued it is important to identify what the goals and needs would be for a long-term program. This would include a greater understanding of both the risk of introduction and establishment of invasive species and the specific actions that would be acceptable based on these risks. This is a primary goal for the program in 2011.

PROGRAM IMPLEMENTATION

Staff with the Tahoe RCD initiated program planning and implementation in January 2010 and a project manager was hired soon after. As an initial pilot program, a significant amount of effort was required to get the program up and running. A large part of the initial effort was getting the watercraft inspection program prepared for the boating season including hiring staff, purchasing equipment, developing protocols, launching outreach efforts, prioritizing water bodies for inspection, and initiating stakeholder interactions. Watercraft inspections were started in May of that year and continued thru September. Complement to that significant effort was development of the TRAISPP as a viable program and coordinating agency and stakeholder participation in the larger program efforts. This section of the report summarizes these efforts including: program development, agency coordination, watercraft inspections, education and outreach, early detection monitoring, and the results of boater surveys.

Program Development

Developing a program that is successful in reducing risk of introduction, addresses existing species, and is sustainable are the cornerstones of effective AIS management. Given the complexity of landownership, jurisdictional authority and geographic location of major water bodies within the Truckee River Watershed, a considerable amount of planning and multi-party agreement must be formalized to achieve organized implementation. Before development of the Program in 2010, a framework for planning discussions was absent, which severely limited the opportunity to develop regional coordination and subsequently provide protection from AIS introduction to the Lower Truckee River watershed. The Tahoe RCD initiated a coordinated, multi-party planning effort specifically intended to accelerate regional prevention and control efforts of AIS. Specifically addressed was the real and advancing threat presented by quagga and zebra

mussels that are rapidly spreading across the western United States. Ongoing coordination, cooperation and targeted management efforts were crucial to the success of this effort.

Fundamental to this endeavor is the development of key regional management considerations, entity roles and responsibilities, and various management strategies for specific water bodies. The ultimate goal of this Program is to develop a comprehensive regional management strategy that addresses agency concerns, analyzes risk and cost/benefit ratios and establishes a prevention and control approach that minimizes the on-going threat of AIS introduction and establishment.

Agency Coordination

Agency coordination and stakeholder collaboration was an important part of program development. It is central to the success of a program that involves multiple jurisdictions, landowners/managers and public interest. The stakeholder list developed during the 2010 program development can be found in Appendix A of this report. While interest and support of the program is considerable, fostering regular participation at stakeholder meetings was challenging given the demanding and conflicting schedules of meeting participants. Nevertheless, stakeholder meetings were held monthly to facilitate programmatic discussions for regional AIS prevention. The meetings included interactive discussions with input and information sharing promoted and cultivated to create a mechanism for collaboration in the evolution of the program throughout the season. The stakeholders were given frequent updates regarding the implementation of the pilot watercraft inspection project, education and outreach efforts, funding strategies and actions by partnering agencies and entities. This enabled the group to respond to issues on the ground as they evolved and react appropriately to community concerns and desires for the program.

Ultimately, a Memorandum of Understanding (MOU) was finalized and signed by 7 partners within the group. We anticipate additional signatories to the MOU in 2011. Due to policy procedures of some partnering agencies, the signatory process can be lengthy as the MOU circulates through appropriate department divisions. Appendix B contains the finalized MOU and signatories as well as letters of support from agencies either waiting for MOU signatures or agencies only able to commit to that level. Additional members for the stakeholder group have been identified and will be invited to participate in 2011.

Watercraft Inspections

For the purposes of implementing a pilot Watercraft Inspection Program (WIP), two alternatives were originally examined; 1) implement a single watercraft inspection station at one reservoir, accounting for all hours of operation and launch sites at the reservoir, or 2) implement watercraft inspections at multiple reservoirs during peak hours, realizing that all hours of operation would not be covered. The second approach was ultimately chosen and recognized the limitations of current funding while simultaneously providing inspection coverage and public interaction at all water bodies. To aid in the development of this approach, an prioritization of the water bodies was performed to determine the risk of introduction and the need, feasibility and placement of watercraft inspectors. As a result of this prioritized approach, TRAISPP focused its watercraft inspections at the primary launch ramps at Donner Lake, Boca, Stampede and Prosser Reservoirs.

To accomplish objectives of the WIP, the Tahoe RCD hired a Project Coordinator to oversee planning, coordination and facilitation of the pilot season. In addition, 6 watercraft inspectors were hired and trained for the 2010 season. Watercraft inspection protocols were designed to follow guidelines developed by the Tahoe Regional Planning Agency, Tahoe RCD, 100th Meridian Initiative and recommendations from the Lake

Tahoe Aquatic Invasive Species Management Plan. Additionally, input was solicited from local lake managers and other key partners to address logistical considerations.

The WIP was an invaluable objective of TRAISPP during 2010 such that measures were implemented to provide some protection against AIS introduction in the region. The inspection program was implemented on May 1, 2010 and continued through the middle of October 2010. Boating was observed continuously on Boca, Stampede and Prosser Reservoirs and Donner Lake from the time when snow first melts off the access roads in the spring, to the time when snowfall blocks access in the fall. Boaters in this region are hardy and are on the waters even during periods of snowfall and rain.

As a first-year pilot program, the WIP is voluntary for boater participation and naturally, procedural implementation differs from a mandatory program. A primary role identified for the WIP was to educate boaters of the detrimental consequences of introducing and spreading AIS and to teach them how they can contribute to the solution. While inspection is a very important aspect of the program, immediate and effective education of the boater on the ramp was crucial, especially in the context of voluntary participation. The realization of this dynamic was integrated into every aspect of the inspection program and the 2010 TRAISPP Pass sticker was designed to implement this philosophy. The TRAISPP Pass solicited participation and commitment from boaters to be Clean, Drained and Dry prior to launching. Boaters were given the opportunity to sign a pledge and receive the sticker which streamlined access on their subsequent visits. By giving the inspector the ability to empower the boater with knowledge of how to prevent the spread of AIS, the connection between the inspectors, boaters and fishing community was far more productive. The TRAISPP Pass was developed and implemented mid-way through the season and in total, 2,432 pledges were signed and 2,511 pass holders returned to launch. An example of the pledge and TRAISPP Pass sticker can be found in Appendix C.



At the 4 primary boat ramps in the region, which include Donner Lake, Stampede, Prosser and Boca Reservoirs 7,436 interactions with boaters were made for inspection, survey and boater education. Fifteen vessels were prevented from launching due to a high risk assessment and sent to decontamination. No vessels were found to have quagga or zebra mussels aboard, and many dozens of boaters were served by having their vessels bleach decontaminated by TRAISPP inspectors on the ramps. A number of vessels were cleaned of aquatic weeds prior to launching. The prevention of aquatic invasive weeds into Donner, Stampede, Prosser and Boca water bodies is a significant accomplishment considering no aquatic weeds were found in a 2010 survey of these water bodies (see Appendix D). In general, staff observations indicated that the majority of boaters were aware of AIS prevention measures and have been practicing the standard 'Clean Drain and Dry' protocols. Boater response and community support show that boater education programs are very successful in the Truckee region.

Watercraft inspectors require a significant amount of initial and ongoing training due to the technical nature of their work, dynamic AIS issues, watercraft mechanical systems and customer service. For this reason, ongoing training was performed at twice-monthly staff meetings. The "Don't Move a Mussel" Video produced by the Pacific States Marine Fisheries Commission (PSMFC) was an invaluable tool and was used repeatedly

throughout the season. Additional training was provided to personnel at Martis Creek Lake, Donner Lake Home Owner Association, Webber Lake and Independence Lake to enhance coordination and collaboration in the multiple water bodies within the lower Truckee River watershed.

Another important aspect of the Watercraft Inspection Program was maintaining regional consistency with the Lake Tahoe Watercraft Inspection Program's protocols and procedures. This consistency is important from a prevention standpoint because many boaters travel between Truckee regional lakes and Lake Tahoe. It is in the best interest of all lakes, if the perception of and need for prevention is similar between water bodies. Furthermore, having similar programs increases the likelihood of sharing available resources.

The decontamination process was discussed at length during stakeholder meetings but did not have adequate traction for immediate implementation. Primary concerns included site location, local disposal of the waste water and operational costs. A portable decontamination machine was made available to TRAISPP through an in-kind contribution from the Tahoe Regional Planning Agency. Decontaminations were performed through the Lake Tahoe inspection program at Alpine Meadows lower parking lot and Northstar-at-Tahoe parking lots. Trained Tahoe RCD staff with the Lake Tahoe program performed the decontaminations. Progress has been made to address some of the concerns with the decontamination process. To avoid inappropriate disposal of the decontamination waste water, members of the TRAISPP stakeholders group are exploring options for other methods such as settling ponds and recycled water systems. These concepts come with added costs but are a necessity for implementation of a decontamination program. Several potential options for suitable decontamination sites have been identified. Tahoe RCD staff has met with private business owners in Truckee interested in providing decontamination services. Additionally, the California Department of Food and Agriculture 1-80/Truckee Inspection Station was identified as a possible site. This facility regularly performs watercraft inspections but needs infrastructure improvements to sustain the decontamination process. A potential site was also identified at the Hirshdale exit from Highway 80. However, as with the inspection station, permitting, funding and coordination will be necessary to achieve the establishment of a permanent site. These relationships will be cultivated in 2011 to provide the best options for the program, local businesses and the boating community.

Education and Outreach

Education and outreach is a fundamental component of any program that involves the public. Fortunately, many education and outreach tools targeting AIS prevention have already been developed nationally. Capitalizing on these previously developed items, while creating specific local messages has proven to be successful for the TRAISPP. Once the public understands the risk factors and potential severity of the problem, the vast majority commit to solution-oriented actions. In general, public understanding, perception and awareness were all important elements of the education and outreach activities performed throughout the 2010 season. The single most consistent and resounding comment heard from all parties, with the exception of approximately five to ten percent of the boaters, was to establish a watercraft inspection program for the Truckee region that is user-friendly, inexpensive and a pleasant experience. In fact, 31% of boaters surveyed said they would



pay an annual fee between \$11-\$25 and 25% said they would pay between \$26-\$50 to support program expenses.

However, one interest group, the anglers, showed the greatest amount of disagreement about the program and appeared to be divided into approximately equal polar extremes. On one side, there was support for immediate locked and fully controlled access to all waters with mandatory decontaminations of all watercraft; while the other extreme wanted no program whatsoever, with no interference or added regulation. The later group typically believed that the spread of AIS cannot be controlled, no risk of introduction exists, or that AIS prevention programs are little more than a government attempt to collect more taxes. This dichotomy represents some of the challenges with public education and the mission to inform individuals of AIS risks and prevention. Garnering support and understanding from this user group will require a focused and specific message with a strong linkage between science and management that identifies the consequences of AIS introductions on fisheries. Additionally, it is important for all user groups to recognize how their recreational activities can contribute to the spread of invasive species. For example, it is not only the boat itself that can harbor AIS, but also bait buckets, waders, floatable toys and other equipment.

In addition to standardized brochures produced and distributed nationally, permanent signs were installed to alert boaters to the 'Clean Drain and Dry' message. Eighteen Signs (pictured above) were provided by the US Bureau of Reclamation in coordination with the California Department of Fish and Game for use in the TRAISPP. Fourteen of these signs were installed by TRAISPP staff at the launches at Boca, Stampede and Prosser Reservoirs, as well as at all four launches on Donner Lake. All locations and installations were coordinated and approved by the facility's managers. The signs are an important reminder to boaters to maintain Clean, Drain and Dry practices and a helpful identification for the presence of TRAISPP. Additional signage is needed on the ramps, such as sandwich boards immediately adjacent to the inspection area in order to identify the program to the boaters. Sandwich boards could also be a valuable educational tool at the launches (for the boaters in the queue to launch) and at events such as county fairs and boating and recreation shows. TRAISPP will continue to develop these improvements as feasible. To further promote the identity of the program, a logo was developed (pictured right). Logos are a good way to create branding for the program, giving it a unique identifier.



While the production and distribution of handouts and other educational materials is a basic component of an education and outreach program, one-on-one public interaction is also necessary. For this reason, numerous public presentations were held to engage the public and garner input directly related to the program. Interaction with the audience was always promoted during the presentations to address concerns, formulate ideas and provide for the greatest opportunity for information sharing. In addition to the public presentations, meetings were held with representatives from the Placer County Resource Conservation District, the Donner Lake Property Owners Association, Gardner Combs, Nevada County Fifth District Supervisor, Town of Truckee Town Manager, Truckee Meadows Water Authority and the California Department of Food and Agriculture's Truckee/I-80 border Agricultural Inspection Station. Dozens of additional personal meetings and discussions occurred with many community leaders, members of the press, governmental agency and non-governmental organization staff members, staff of other AIS programs, and members of the community. All of these interactions supported the objective of providing education and coordinating regional AIS concerns and issues.

Early Detection Monitoring

Early detection monitoring is an important part of AIS management as it allows for the quick response necessary to prevent further spread and impact by catching the establishment of AIS early. The objective of this project was to coordinate collections by different agencies monitoring efforts to conduct a snap shot assessment of water quality and to monitor invasive invertebrate and plant communities in lakes and reservoirs within the Truckee River region (Donner Lake, Stampede Lake, Boca Reservoir, Prosser Reservoir, Marlette Lake, Spooner Lake, Martis Creek Lake, Pyramid Lake, Lahontan Reservoir, Rye Patch Reservoir, Independence Lake, and Webber Lake) during the 2010 season. Specifically the goals were to:

1. Develop a method to survey lake shorelines for aquatic invasive invertebrate (Dreissenid mussels, New Zealand mudsnail, Asian clam, and crayfish) and invasive plant (Hydrilla and Eurasian water milfoil) species.
2. Assess lakes for invasive invertebrate and plant species by conducting shoreline surveys at the beginning and end of the season, sampling for mussel veligers every 4-6 weeks using net hauls, and setting minnow traps at the end of the season to sample for invasive fishes and crayfish.
3. Assess water quality by conducting water quality profiles for basic parameters (temperature, dissolved oxygen, and specific conductivity) every 4-6 weeks, collect water samples from each physical strata at the beginning and end of the season for nutrient (nitrogen, phosphorus, and calcium) analysis, and collect sediment pore-water at 3 different locations in each lake at the end of the season to determine if the water bodies can sustain mussels.

A detailed description of the methods and results can be found in the 'Inventory of Aquatic Invasive Species and Water Quality in Lakes in the Lower Truckee River Region: 2010' contained in Appendix D.

Boater Surveys

The presence of watercraft inspectors at launch sites provided an excellent opportunity to interact with the user groups of each of the water bodies. In addition to performing inspections, boaters were surveyed to better understand the usage patterns at each of the water bodies. The summary of results characterizes a general representation of boater information in the four water bodies where inspections/interactions occurred during 2010. Appendix E provides an example of the data forms used to gather the boater survey results information.

Watercraft inspections were performed during peak days and times; therefore, not all boaters or activities can be accounted for in the results presented. However, after careful consideration of the data analysis, the results do seem reasonable. Table 2 is simply a breakdown of inspections/interactions at each of the 4 water bodies. Stampede was the busiest of all of the waters consistently throughout the entire season. Donner Lake was busy primarily during the heart of the season, but was slow early and late in the season. Boca had water levels below the launch early and late in the season, so was busiest in July and August. Prosser is a much less visited water overall and is primarily used by anglers.

Water Body	Interactions
Stampede Reservoir	3,694
Donner Lake	2,093
Boca Reservoir	1,515
Prosser Reservoir	134
Total	7,436

Not surprising, the majority of boaters originate in California with the next largest visitation from Nevada. Further analysis from zip code data revealed that 24% of the California boaters and 31% of the Nevada boaters came from within the Truckee River watershed (Table 3). Interestingly, boaters traveled from as far

away as Alaska and Tennessee, and also traveled from areas with notoriously infected water bodies such as Minnesota and Illinois.

Table 4 provides a breakdown of use across different activities and water bodies. The type of boater is an important dynamic in the process of AIS prevention since each type has different patterns of use and presents different vector types for transmission of AIS to other water bodies. Staff often noted different attitudes associated with different user groups with respect to AIS prevention. Anglers tend to be strongly divided to one polar extreme or another.

Angler's vessels are typically quick to inspect due to their general simplicity and smaller size. Personal watercraft (PWC) boaters can launch off shorelines easily in the Truckee region so with the limitations in the inspection program, capturing all these users probably fell short. Of the users in this group that inspectors interacted with, they were generally less aware of AIS issues than the other boaters and typically were on the water in the mid day hours. Pleasure boaters were often educated on the issues, supportive of the program goals and on the water in the mid day hours. Ski/Wakeboard boaters also were generally knowledgeable and supportive. Stampede and Prosser had the most use by anglers. Boca was found to be the most popular for skiing, wakeboarding, and PWC boaters. Donner was the most popular for the pleasure boaters, but also had the most diverse mix of boaters.

State	Percentage
Alaska	0.02%
Arizona	0.08%
California	66.40%
Canada	0.08%
Idaho	0.08%
Illinois	0.02%
Minnesota	0.03%
Montana	0.08%
Nevada	32.20%
Oregon	0.70%
Pennsylvania	0.03%
South Dakota	0.20%
Tennessee	0.02%
Texas	0.03%
Utah	0.02%

Water Body	Angling	Canoe Kayak	Personal Watercraft	Pleasure	Pontoon	Sail	Ski Wakeboard
Stampede Reservoir	73%	0%	4%	7%	0%	1%	15%
Donner Lake	41%	2%	16%	29%	0.50%	1.50%	10%
Boca Reservoir	13%	1%	21%	15%	0%	0%	50%
Prosser Reservoir	94%	0%	0%	6%	0%	0%	0%
Combined Usage	61%	1%	8%	12%	0%	1%	17%

STRATEGIC PLANNING CONSIDERATIONS

Strategic planning is important to the continued success of the program and facilitates good management of a process. The Tahoe RCD recognizes that a good strategic framework outlines the overall goals, objectives and direction of a program, which is appropriate for the initiation and development of a program. For the purposes of TR AISPP a simplified strategic planning process was developed as a tool for guiding the pilot program. TR AISPP members engaged in a planning process to identify the program's direction, allocation of resources and operational procedures. Various analysis techniques are used in strategic planning and TR AISPP adopted a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) as a beginning point of reference. This should be considered a draft effort as much greater planning will need to occur as the

program matures and continues. This is going to be particularly true over the next year as the TRAISSP begins to solidify its funding strategy and management alternatives for the program

SWOT Exercise

As part of this pilot effort, a standard SWOT exercise (Strengths, Weaknesses, Opportunities and Threats) was performed. The purpose of this was to understand the current dynamics facing the program in order to strategically consider alternatives and options. Undoubtedly, this exercise will result in greater detail over the next year as funding is made available for a more robust and detailed strategic planning process. The results of this initial exercise are presented below.

Strengths

- Community Concern and support
- Educated recreational community and other organizations
- Good start to stakeholder collaboration
- Pilot program is feasible with demonstrated success
- Regional ties and support
- Provides Jobs and protects economic interests - tourism
- Strong argument for existence
- National marketing campaign - awareness

Weaknesses

- No county ordinance or regulatory authority
- Need for peer reviewed science and science based risk assessment
- Lack of long-term funding source
- Geographic challenges - widely dispersed water bodies
- Access to water bodies is difficult to control

Opportunities

- Current lack of invasive species in regional water bodies
- Linkages to other programs in the region
- Regional and national educational materials
- Funding partnerships
- Ordinances, MOU's
- Organizational structure
- Establishment of AIS programs for the entire Truckee watershed

Threats

- Lack of comprehensive risk assessment
- Potential risk of introduction and establishment of various species
- Lack of long-term funding structure
- Proximity of water bodies to a major interstate highway
- Advancement of numerous AIS in western states
- Risk of quagga mussel introduction and establishment in other Nevada lakes

Need for Comprehensive Risk Assessment

Strategic planning discussions identified that a comprehensive risk assessment should be completed to better inform management options. While this program was not specifically intended to perform a risk assessment it is an inherent consideration of any invasive species program. Comprehensive risk assessments can be complicated and take a considerable amount of time to complete. As such, completion of a comprehensive risk assessment was outside the scope of this program. However, as the program advances the completion of this type of assessment would be invaluable.

Numerous issues were identified in discussions that should be considered when evaluating risk. First, when considering the risk of invasive species you need to consider two important points 1) the risk of introduction, and 2) the risk of establishment. These considerations would be different for each invasive species that you are evaluating. For example, Eurasian watermilfoil is present in water bodies in close proximity to the water bodies considered in this report. The risk that this invasive species could be transported and introduced into a local water body where it is not present could be considered high. However, fluctuating water levels, climactic conditions, and suitable habitat in some regional water bodies could make it challenging for the species to establish even if introduced. Consequently, the risk of establishment could be considered moderate depending on the water body being considered.

Also important to consider is the ecological and economic impact associated with the establishment of an invasive species. In the case of quagga and zebra mussels, it is their profound ecological and economic impacts that make them a particular threat. The fact that these species are very difficult to control and virtually impossible to eradicate once established adds considerably to the threat they present.

Other important points that were raised in discussions about risk include:

- Invasive species such as Hydrilla, water hyacinth, New Zealand mud snail and others are spreading in western states
- Lake Tahoe science suggests adult quagga mussels can survive in low calcium water
- Calcium levels in some regional water bodies are high enough during certain periods of the year to suggest survivorship of adult quagga mussels. The ability of juvenile mussels to survive in low calcium water is uncertain.
- Invasive species are highly adaptable
- Asian clams have recently been confirmed to be present in Donner Lake
- Eurasian watermilfoil is present in water bodies in close proximity – Truckee River, Lake Tahoe and Martis Creek Lake
- Boater surveys indicate that users come from distant areas
- Proximity of regional water bodies to a major interstate highway presents opportunity for introduction from distant areas
- Cost of prevention verses control and/or maintenance.

Funding and Program Sustainability

Significant progress was made on identifying potential long-term funding for program implementation including the need for a multi-party funding program which recognizes that no single entity is responsible for

prevention and control of invasive species. However, before a specific funding strategy can be pursued it is important to identify what the goals and needs would be for a long-term program. This would include a greater understanding of both the risk of introduction and establishment of invasive species and identification of the specific management alternatives that would be acceptable based on these risks. Regardless of the risk and management alternative that is ultimately determined to be acceptable for each water body, it is clear that a multi-party funding strategy will need to be developed in order for the program to be sustainable.

Specifically, it was identified that stakeholders that would be directly impacted by the establishment of problematic invasive species would express the greatest interest in contributing funding to sustain the program. This would include a wide spectrum of potential funders including water purveyors, water users, resource and facility managers, local jurisdictions, and recreational users. While grants could be a useful funding tool for specifically identified needs such as a decontamination station, eradication projects or specialized areas of research, the use of grant funds would need to be a minimal component of a long-term sustainability strategy.

One of the primary goals for the program in 2011 is to initiate a more specific stakeholder process to better determine the acceptable level of risk for each water body and then identify management alternatives and associated costs. This is a fundamental first step towards approaching potential funders. This allows potential funders the opportunity to better understand what is being asked of them, what they are contributing to, and understand the specific benefits from their contribution. Ultimately, the future implementation of the program is dependent on how successful the program is at the development of funding sources.

Tied to this success is the need to develop jurisdictional ordinances and regulations that provide the authority to develop fee systems that would allow users to contribute to funding the program. The determination of how fees will be collected and what rates would be acceptable is an important element to sustaining the program. Importantly, boater surveys indicate that only 25% of boaters would be unwilling to pay an annual fee. However, if shown that their fees are a contribution to a larger funding effort that percentage could drop when they realize that the program is not entirely funded by the boating community.

Work in the Tahoe Basin has also shown that when watercraft inspections are part of a larger effort to prevent, control, and eradicate invasive species people are more willing to support the program. This is particularly true when those efforts can be shown to help improve and protect the habitat of recreational fisheries. It is also important to note that specific control and eradication projects are likely to be funded by grants and other funding mechanisms as part of an AIS program rather than a specific operational cost of the program.

Management Alternatives

A full range of management alternatives has been considered for continued implementation of the program. These alternatives range from a do noting alternative to stringent alternatives that include restricted access. There is a great deal of variability between the water bodies in the region which will require significant stakeholder input about the risk of introduction and establishment of invasive species depending on the water body being evaluated. Consequently, a one size fits all approach will be extremely unlikely as the program will need to address this variability and apply its resources to the water bodies with greatest risk.

The program took a similar approach this year when determining how best to deploy watercraft inspectors around the region. It was decided that the risk of introduction would be a principle factor in determining where and when inspectors should be stationed. Consequently, Independence Lake which is owned by the Nature Conservancy and does not allow launching of motorized watercraft was considered a low priority for placement of watercraft inspectors. At this lake, program staff worked with lake managers and emphasized education and outreach to inform the user groups about how best to protect the resources at that lake. On the

other hand, Stampede Reservoir receives the most amount of use in the region and inspectors were stationed to provide the greatest degree of coverage and public interaction.

The boater surveys completed this year will be extremely useful in stakeholder discussions over the next year about management alternatives. Having a greater understanding of usage patterns around the region will be invaluable to these discussions. Additionally, the works completed by University of Nevada Reno, California Department of Fish and Game, and the Bureau of Reclamation on water chemistry will also add to these discussions. Specifically, having a better understanding of calcium concentrations in specific water bodies will significantly add to discussion about the potential for establishment of quagga and zebra mussels in regional water bodies.

PROGRAM OBJECTIVES - 2011

TRAISSPP intends to maintain the implementation of watercraft inspections and decontaminations, refine a comprehensive education and outreach program for AIS prevention and continue early detection monitoring over the next year. A fundamental goal of the program is to solidify and expand the multi-party collaboration and management of the TRAISSPP to include additional potential funders. Building on the success of this year's pilot program, TRAISSPP will be able to apply the greater understanding of usage patterns and associated risks with the best available water quality science. The results of data collected in the 2010, as well as, considerable public input from the many meetings, community forums and presentations made thus far, will be evaluated by the stakeholder group to make the most effective decisions in the strategy and future programmatic structure of the TRAISSPP. Central to the coming year's efforts will be the engagement of stakeholders in discussions regarding risk, programmatic management alternatives, and the development of a multi-party funding strategy for long-term implementation. These efforts will be greatly advanced with the application of Strategic Planning funding and the understanding that an invasive species program in the Truckee region is supported and viable.

ACKNOWLEDGMENTS

The ongoing success of this program will be the result of the continued support and contributions from the agencies, jurisdictions, stakeholders and community members of the Truckee Region. While too numerous to mention all of the contributors to this program the Tahoe RCD would like to extend its sincere appreciation to all of the individuals and agencies that participated in our monthly stakeholder meetings, and those that provided resources, suggestions, comments and encouragement to the program. In particular, the Tahoe RCD would like to thank the Truckee River Fund for providing the resources to initiate this program and the boating community for their patience, understanding, and input.



