

## Aquatic Invasive Species (AIS) Fact Sheet

AB167

2011 Nevada Department of Wildlife



Aquatic invasive species, throughout the nation and particularly in Nevada, are threatening our state's fish and wildlife, drinking and irrigation water supplies, hydroelectric generation, ecological food webs, native species and Nevada's citizen's recreational opportunities. In addition, AIS pose a significant economic threat when prevention or eradication measures do not exist or fail. The problem is real and consists of hundreds of species of foreign and alien plants, algae, shellfish, fish, and other alien animals that are threatening our waters. The resolution to the invasion of AIS will take the collaborated efforts of various state, tribal and federal agencies, water districts and other stakeholders, local governments, and Nevada's recreational citizens.

Provided below is various economic facts relative to AIS from both a national and state level. Following national and state level economic facts are several economic impacts of AIS in Nevada waters followed by funding mechanisms of other western state AIS programs. The conclusion is centered on the Nevada Department of Wildlife's current AIS Program and AIS photographs.

### ■ National and Various State's Economic Impacts of Invasive Aquatic Weeds, Invertebrates and Vertebrates

\$79 billion nationally 1906-1991 for plant and animal AIS (EPA 2005)

\$134 billion nationally by 2050 with 15 recent AIS introductions (EPA 2005)

\$97 billion to \$137 billion national estimated damage related to 19 AIS species (EPA 2005)

\$100 million annually spent nationally on control of aquatic weeds (Rockwell 2003)

\$45 million Purple Loosestrife management costs and loss of forage on a national basis (Aquatic Nuisance Species Task Force)

\$3.1 billion nationally to the power industry from 1993 to 1999 (EPA 2005)

\$5 billion national impact on industry, businesses and communities (EPA 2005)

\$24-31 million annually - Estimated impacts to hydropower if a potential Snake River/Colorado River infestation occurred (Philips 2007): Fish passage facilities; screens, fish ladders, gatewells \$1.1M, \$1.95M and 1M, respectfully (USACE 2010): Hatchery facilities; 1M for filtration system per hatchery plus \$1M annual cleaning and monitoring; impacts to recreation, water supply, navigation, and marinas: estimated \$50M annually but could range from tens to hundreds of millions annually; impacts to native aquatic species; unknown, but estimated to be \$10-100 Million annually (IEAB 2010-1).

\$150,000 per generator in mitigation strategies with annual maintenance of \$100,000 is the estimated costs to hydroelectric plants for mussel infestation (PSMFC 2005).

\$2+ million to upgrade water treatment facilities in Wichita, Kansas for zebra mussel impacts (KS per. Comm. 2011)

\$200 million annually in the Great Lakes region to raw water users, commercial and sport fishing due to zebra mussels (EPA 2005)

\$4 million spent to control Water Hyacinth in Louisiana with annual losses in agriculture, drainage, fish and wildlife, public health and navigation is estimated at \$35 million

\$200,000 to \$1 million estimated sales volume reduction attributed to Davis Lake, Ca northern pike eradication project (CF&G 2008).

#### ■ Quagga Mussel and Northern Pike Impacts to Nevada's Waters

Although this section is specifically addressing quagga and northern pike introductions, Nevada currently has a variety of various AIS inhabiting our waterways. Other species of concern are purple loosestrife, tamarisk, Eurasian milfoil, curly pond weed, didymo (alga), Asian clams, Asian carp, common carp, New Zealand mud snail, tilapia, and various aquarium fish.

\$1 million year Hoover Dam annual budget for quagga mussel control (BOR Per. Comm. 2011)

\$172,600 annually for chlorination additions at Southern Nevada Water Authority: removal of quagga's from one drinking water intake tunnel \$340,000: routine maintenance and removal \$6,000: proposed chemical control \$560,000: research on the invasion \$300,000 (SNWA Per. Comm. 2011).

\$1.6 million estimated Angler Use Days decrease at Comins Lake since 2004 (~\$324,000/year) primarily due to Northern Pike population increases and decreases in trout species (NDOW 2011). Peak angular use days were 35,000 in 2004. Angular use days have decline yearly since 2004 to approximately 7,000 in 2009.

\$3-5 million to retrofit water filtration system at NDOW's Lake Mead Fish Hatchery due to quagga infestation: unknown indirect dollar impacts to fishing license sales and a decreases of 500,000 annual trout fish stocking in Southern NV lakes and streams.

#### ■ Western State AIS Programs that Implement a Sticker Program

Three western states currently use an AIS Sticker Program to partially or fully fund their respective AIS program. Those states include Idaho, Oregon and Wyoming. In addition, Lake Tahoe implements a sticker program to supplement their AIS program.

1. Idaho's AIS Program is funded through federal grants, state general fund and AIS Sticker Program. Federal grants and state general funds are used to address both terrestrial and aquatic plant invasive species. The AIS Sticker Program is used to fund vessel inspections, AIS staff, decontamination units, monitoring and educational materials. The fee is collected through vessel registration fees and/or private vendors selling fishing licenses. Annual budget is approximately \$1.9M with \$850,000 generated from the AIS sticker program.

\$10 annually per motorized vessel for resident plus \$2.00 Vendor Handling Fee

\$20 annually per motorized vessel for out of state plus \$2.00 Vendor Handling Fee

\$ 7 annually per vessel for non-motorized vessels

The only exemption to Idaho's AIS Sticker is non-motorized Inflatable's <10 ft in length

2. Oregon's AIS Program is funded through an AIS Sticker Program and is used to fund boat inspection teams, AIS staff, decontamination units, monitoring, equipment, and education and outreach efforts. The program encompasses invasive plants and animals. Annual budget is approximately \$1M with 100% generated from AIS sticker program.

\$ 5 every two years per motorized vessel for residents plus a \$2.00 agent fee

\$20 annual permit for non-resident motorized vessels plus a \$2.00 agent fee

\$ 5 annually for non-motorized vessels – resident vessels <10 ft in length plus a \$2.00 agent fee:

Note: non-motorized permit is transferable between vessels

\$ 5 annual fee for non-motorized - non-resident vessels <10 ft in length plus a \$2.00 agent fee

3. Wyoming's AIS Program is funded through general fund appropriations and a sticker program. The AIS Sticker Program is used to fund inspection, decontamination units, AIS staff, monitoring, training, advertising and education and outreach. Annual budget is approximately \$2.1M with \$500,000 funded through the AIS Sticker Program.

\$10 annually per motorized vessel for resident

\$30 annually per motorized vessel for non-resident

\$ 5 annually per non-motorized vessel for resident

\$15 annually per non-motorized vessel for non-resident

4. Lake Tahoe Basin AIS Program is administered through the Tahoe Regional Planning Agency (TRPA). Current funding is approximately \$4.4 M for 2011. The program's funding is primarily received from the Southern Nevada Public Lands Management Act with additional funds received from boat inspection/AIS inspection fees and partnerships with California, Nevada and the federal government. Current expenditures consists of watercraft inspections and other prevention measures \$2M, control and eradication of AIS species \$2.3M, monitoring and response \$65,000, and education and coordination \$30,000. Motorized boat inspection and certification fees range in price depending on the length of the boat, horsepower, and if the boat is in contact with other waters outside of Lake Tahoe. Non-motorized vessels require inspection and certification but are not subject to a fee.

\$20 to \$60 Annual Sticker Fee for Tahoe Only Motorized Boats

\$30 to \$125 Annual Sticker Fee for "In and Out" Motorized Boats that visit other waters

Note: Lake Tahoe Average Vessel Fee for "In & Out" is \$65 to \$75 for 16-25ft boat

■ Other Western States AIS Programs that do not implement a Sticker Fee

1. Utah's AIS Program is funded through general fund revenues, federal grants and partnership funds with water districts. General fund revenues are approximately \$1.4M annually and grant/partnership funds are approximately \$400,000 per year to use at partner-specified lakes.
2. Colorado's AIS Program is funded primarily through severance tax and general funds. Severance tax funding consisted of \$2.6M and \$1.2M wildlife general funds for a total annual budget of \$3.9M. In addition, the state has formed partnerships with various entities on site-specific projects that have contributed another \$548,000. Those partnership consist of water districts, county and federal agencies.

■ Nevada Department of Wildlife's current AIS Program

NDOW's AIS Program is currently anticipating several developmental program strategy assignments relative to the prevention and/or spread of various species of AIS in the state. In addition, NDOW currently implements a surface water quagga (veliger) monitoring program, and provides AIS education, training and outreach to citizens and other agencies.

One of the primary program strategies is the development of a Nevada Statewide Aquatic Invasive Species Management Plan. Nevada is one of the few remaining states that currently does not have a management plan. Generally, AIS management plans consist of various components ranging from prevention, monitoring, control/eradication, management strategies, education, laws and regulations, research, response, identification of vector pathways, and the ranking and prioritization of potential AIS threats to surface waters and the ranking of those surface waters to AIS vulnerability. NDOW's AIS Program is currently evaluating the key components of a Statewide Invasive Species Management Plan, however, given the board nature in scope and boundaries of AIS problems threatening the state, the development of a management plan will require the formation and partnership of an executive committee and an advisory council to provide oversight to the plan development.

NDOW is anticipating the formation of an executive committee and an advisory council consisting of representatives from various state, federal and tribal agencies in addition to private sector entities, sportsmen and other interested citizen groups in the development of the management plan.

Additional AIS information can be found on the following web sites:

Western Regional Panel: <http://www.fws.gov>

Aquatic Nuisance Species Task Force: <http://www.anstaskforce.gov>

100<sup>th</sup> Meridian Initiative: <http://www.100thmeridian.org>

USGS: <http://www.nas.er.usgs.gov>

**Zebra Mussel Infestation in Kansas Lake**



**Quagga Mussels Infestation in Pipe**



**Hoover Dam Quagga Mussels Infestation**

**Intake Towers - April 2009**

This composite image shows the impact of quagga mussels on Hoover Dam's intake structures. On the left, there are photographs of trash racks heavily encrusted with mussels, with a yellow measuring tape indicating the thickness of the infestation. On the right, a technical diagram of an intake tower is shown with labels for different sections: 'Fore bay - 1094 ft', 'Intake - 1045 ft', and 'Intake - 895 ft'. Below the diagram, there are labels for 'Trash Racks - 6/2009' and 'Upper Cylinder Gate - 11/2007'. The word 'RECLAMATION' is printed in large blue letters at the bottom.

Photos courtesy of Aaron Muehberg, Mechanical Engineer Hoover Dam

**Penstock belly drain - October 2010**

A photograph showing the interior of a penstock belly drain. The drain is filled to the brim with a large volume of quagga mussels, completely blocking the flow of water. The word 'RECLAMATION' is printed in large blue letters at the bottom.

**Northern Pike Infestation, Comins Lake, NV**



**Eurasian Water Milfoil Infestation**



**Aquatic Weeds – Lake Havasu, AZ  
October 2010**

Photo courtesy of Al Graves, Central Arizona Project (CAP) Engineer

**RECLAMATION**

**Aquatic Weeds – Lake Havasu, AZ  
August 2008**

Photos courtesy of Al Graves, Central Arizona Project (CAP) Engineer

**RECLAMATION**