2013 ANNUAL REPORT

AQUATIC NUISANCE SPECIES MANAGEMENT PLAN

WELLS HYDROELECTRIC PROJECT

FERC PROJECT NO. 2149

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Public Utility District No. 1 of Douglas County
East Wenatchee, Washington

EXECUTIVE SUMMARY

The Aquatic Nuisance Species Management Plan (ANSMP) is one of six Aquatic Resource Management Plans contained within the Aquatic Settlement Agreement (Agreement). Collectively, these six Aquatic Resource Management Plans are critical to direct implementation of Protection, Mitigation, and Enhancement measures (PMEs) during the term of the new license and, together with the Wells Anadromous Fish Agreement and Habitat Conservation Plan (HCP) will function as the Water Quality Attainment Plan (WQAP) in support of the Clean Water Act Section 401 Water Quality Certification for the Wells Hydroelectric Project (Project).

To ensure active stakeholder participation and support, the Public Utility District No. 1 of Douglas County (Douglas) developed all of the resource management plans in close coordination with agency and tribal natural resource managers (Aquatic Settlement Work Group or Aquatic SWG). During the development of this plan, the Aquatic SWG focused on developing management priorities for resources potentially impacted by Project operations. Members of the Aquatic SWG include the U.S. Fish and Wildlife Service (USFWS), Washington Department of Ecology (Ecology), Washington State Department of Fish and Wildlife (WDFW), the Confederated Tribes of the Colville Reservation (Colville), the Confederated Tribes and Bands of the Yakama Nation (Yakama), and Douglas.

The National Marine Fisheries Service (NMFS) was invited to participate in the development of Aquatic Resource Management Plans, but declined because its interests are currently satisfied by the measures within the HCP.

The goal of the ANSMP is to prevent the introduction and/or spread of aquatic nuisance species in Project waters. Douglas, in collaboration with the Aquatic SWG, has agreed to implement several PMEs in support of the ANSMP. The PMEs presented within the ANSMP are designed to meet the following objectives:

Objective 1: Implement best management practices to prevent Eurasian watermilfoil (*Myriophyllum spicatum*) proliferation during in-water (i.e., construction, maintenance, and recreation improvements) improvement activities in the Project.

Objective 2: Continue participation in regional and state efforts to prevent the introduction and spread of aquatic nuisance species. Activities include continued monitoring for the presence of ANS, monitoring bycatch data collected during other aquatic management plan activities, and conducting education outreach within the Project.

Objective 3: In response to proposed changes in the Project requiring FERC approval, the Aquatic SWG will assess the potential effects, if any, with respect to the introduction or proliferation of aquatic nuisance species in the Project to inform management decisions to support success of the ANSMP and will implement reasonable and appropriate measures to address any potential effects.

This ANSMP is intended to be compatible with other aquatic nuisance species management plans in the Columbia River mainstem. Furthermore, this management plan is intended to be

supportive of the HCP, Bull Trout Management Plan, Pacific Lamprey Management Plan, Resident Fish Management Plan, White Sturgeon Management Plan, and Water Quality Management Plan by continuing to prevent the introduction and/or spread of aquatic nuisance species in Project waters. The ANSMP is intended to be not inconsistent with other management strategies of federal, state and tribal natural resource management agencies.

1.0 INTRODUCTION

The Aquatic Nuisance Species Management Plan (ANSMP) is one of six Aquatic Resource Management Plans contained within the Aquatic Settlement Agreement (Agreement). Collectively, these six Aquatic Resource Management Plans are critical to direct implementation of Protection, Mitigation, and Enhancement measures (PMEs) during the term of the new license and, together with the Wells Anadromous Fish agreement and Habitat Conservation Plan (HCP), will function as the Water Quality Attainment Plan (WQAP) in support of the Clean Water Act Section 401 Water Quality Certification for the Wells Hydroelectric Project (Project).

To ensure active stakeholder participation and support, the Public Utility District No. 1 of Douglas County (Douglas) developed all of the resource management plans in close coordination with agency and tribal natural resource managers (Aquatic Settlement Work Group or Aquatic SWG). During the development of this plan, the Aquatic SWG focused on developing management priorities for resources potentially impacted by Project operations. Entities invited to participate in the Aquatic SWG include the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), Washington Department of Ecology (Ecology), Washington State Department of Fish and Wildlife (WDFW), the Confederated Tribes of the Colville Reservation (Colville), the Confederated Tribes and Bands of the Yakama Nation (Yakama), and Douglas.

The ANSMP will direct implementation of measures to prevent the introduction and/or spread of aquatic nuisance species in Project waters. To ensure active stakeholder participation and support, Douglas developed this plan, along with the other aquatic management plans, in close coordination with the members of the Aquatic SWG.

The Aquatic SWG agrees on the need to develop a plan for the long-term management and prevention of aquatic nuisance species in the Project. This management plan summarizes the relevant resource issues and background (Section 2), identifies goals and objectives of the plan (Section 3), and describes the relevant PMEs (Section 4) for aquatic nuisance species during the term of the new license.

2.0 BACKGROUND

Nonnative aquatic species may be released or "introduced" into an aquatic environment intentionally or unintentionally. Most often, such species are unable to adapt to their new environments and do not form self-sustaining populations (ANSC 2001). However, if such a species is able to adapt, become established, and thrive, it has the potential to threaten the diversity or abundance of native species and aquatic habitats and may even affect economic resources and human health. Such species are considered aquatic nuisance species or ANS (ANSC 2001).

RCW 77.60.130 defines the term aquatic nuisance species as a "nonnative aquatic plant or animal species that threatens the diversity or abundance of native species, the ecological stability of infested waters, or commercial, agricultural, or recreational activities dependent on such waters" (RCW 2007). Since few natural controls exist in their new habitat, ANS may spread

rapidly, damaging recreational opportunities, lowering property values, clogging waterways, impacting irrigation and power generation, destroying native plant and animal habitat, and sometimes destroying or endangering native species (ANSC 2001).

2.1 Aquatic Nuisance Species of Concern

2.1.1 Eurasian Watermilfoil (*Myriophyllum spicatum*)

Eurasian watermilfoil (EWM) is an aquatic plant native to Europe, Asia, northern Africa, and Greenland. It was once commonly sold as an aquarium plant (Ecology 2007). EWM may have been introduced to the North American continent at Chesapeake Bay in the 1880's, although evidence shows that the first collection was made from a pond in the District of Columbia during the fall of 1942. By 1985, EWM had been found in 33 states, the District of Columbia, and the Canadian provinces of British Columbia, Ontario, and Quebec (Ecology 2007). The first documented occurrence of EWM in the State of Washington was in 1965. The source of introduction was most likely from sources in Canada and despite an effort to stop its spread, EWM infestations in Lake Osoyoos, British Columbia spread down through the Okanogan Lakes and into the Okanogan River and the Columbia River in 1974 (Duke 2001).

EWM is extremely adaptable with the ability to thrive in a variety of environmental conditions. It grows in still to flowing waters, can tolerate salinities of up to 15 parts per thousand, grows rooted in water depths from 1 to 10 meters, and can survive under ice (Ecology 2007). Relative to other submersed plants, EWM requires high light, has a high photosynthetic rate, and can grow over a broad temperature range (Ecology 2007). EWM exhibits an annual pattern of growth. In the spring, shoots begin to grow rapidly as water temperatures approach 15 degrees centigrade. When they near the surface, shoots branch profusely, forming a dense canopy (Ecology 2007). Typically, plants flower upon reaching the surface and die back to the root crowns, which sprout again in the spring.

Although EWM can potentially spread by both sexual and vegetative means, vegetative spread is considered the major method of reproduction. During the growing season, the plant undergoes autofragmentation. The plant fragments often develop roots at the nodes before separation from the parent plants. Fragments are also produced by wind and wave action, control harvest activity and boating activities, with each plant fragment having the potential to develop into a new plant (Ecology 2007).

EWM is classified as a class B noxious weed by the Washington State Noxious Weed Control Board (WNWCB 2007). Class B noxious weeds are nonnative plants whose distribution is limited to portions of Washington State. Additionally, EWM has been identified as a nuisance species in the Washington State Aquatic Nuisance Species Management Plan (ANSC 2001). EWM can adversely impact aquatic ecosystems by forming dense canopies that often shade out native vegetation. Monospecific stands of EWM affect aquatic habitat, water quality, can impact power generation and irrigation, and interfere with recreational activities. In Washington, private and government sources spend about $1,000,000 per year on EWM control (Ecology 2007).

2.1.2 Zebra Mussel (*Dreissena polymorpha*) and Quagga Mussel (*Dreissena rostriformis bugensis*)

Zebra and quagga mussels are freshwater, bivalve mollusks that typically have a dark and white (zebra-like) pattern on their shells. They are native to Eurasia and were both introduced into the Great Lakes as a result of ballast water discharge from transoceanic ships that were carrying veligers, juveniles, or adult mussels (USGS 2007). Zebra mussels first invaded North America in the mid-1980s and quagga mussels invaded a few years later in 1989 (USFWS 2007). These two species are closely related with subtle morphological differences. More research is needed on North American quagga mussels to assess ecological differences between the two species, but the practical implications of both species are essentially identical (USFWS 2007). The North American distribution of these species has been concentrated in the Great Lakes region of the U.S. with the zebra mussel distribution also spanning farther into the southern U.S. (Figure 2.1-1). Despite recent measures to prevent their westward expansion, quagga mussels were discovered in the Lake Mead Recreation Area. Populations have subsequently been found throughout the Boulder Basin of Lake Mead (Figure 2.1-1) and in more than a dozen reservoirs serving Southern California (Pam Meacham, pers. comm.).

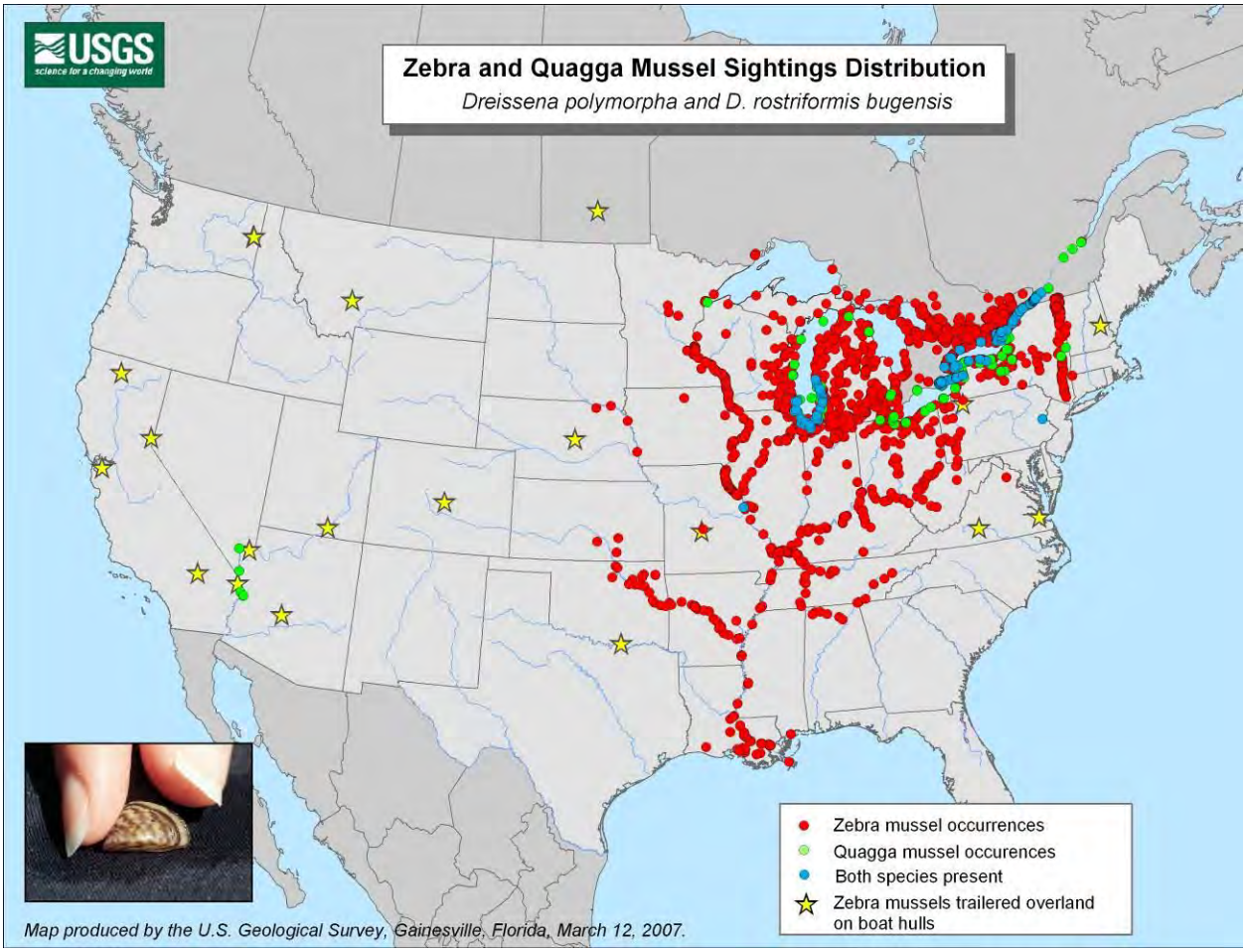

Figure 2.1-1 Zebra and Quagga Mussel Sightings Distribution Map (USGS 2007).

Zebra and quagga mussel size varies from microscopic to two inches long. Typical lifespan is up to 5 years. Both species may spawn year around if conditions are favorable. Peak spawning typically occurs in spring and fall. *Dreissena* are dioecious (either male or female) with external fertilization. Both species are prolific reproducers. Fecundity is high with a few individuals having the capability of producing millions of eggs and sperm (USFWS 2007). After fertilization, pelagic microscopic larvae, or veligers, develop within a few days and these veligers soon acquire minute bivalve shells. Free-swimming veligers drift with currents for three to four weeks until suitable substrate for settling is located. Adults attach to hard surfaces via byssal threads, but can detach and move to new habitat. Both species can tolerate a wide range of water temperatures (1-30°C), low velocities (<2 m/sec), and prefer hard surfaces for attachment although quagga mussels can live in soft sediments (USFWS 2007). Zebra mussels are typically found just below the surface to about 12 meters and quagga mussels are typically found at any depth where oxygen is available (USFWS 2007).

Zebra mussels have caused major ecological and economic problems since their arrival in North America, and quagga mussels pose many of the same threats. Both species are prolific filter feeders, removing substantial amounts of phytoplankton and suspended particulate from the water thus impacting aquatic ecosystems by potentially altering food webs (USGS 2007). *Dreissena's* ability to rapidly colonize hard surfaces causes serious economic problems. These major bio-fouling organisms can clog water intake structures such as pipes and screens, therefore reducing capabilities for power and water treatment plants. Recreation-based industries and activities have also been heavily impacted; docks, breakwalls, buoys, boats, and beaches have all been heavily colonized (USGS 2007). Zebra mussel densities have been reported to be over 700,000 individuals per square meter in some facilities in the Great Lakes area. Each year, the economic impact to the U.S. and Canada is approximately $140 million in damage and control costs (Sea Grant 2007).

2.2 Project Information

Past aquatic studies contributing information to aquatic nuisance species of concern, discussed above, consisted of an aquatic macrophyte species composition and mapping survey (Lê and Kreiter 2005) and a macroinvertebrate assessment and rare, threatened, and endangered (RTE) species survey (Bioanalysts 2006). Results of these studies and other Project aquatic studies indicate that the aquatic ecosystem within the Project is composed of a diverse community of flora and fauna consisting of varied aquatic taxa such as plankton, macroinvertebrates (insects, snails and bivalves), fish, and plants. Although nonnative species are present within Project waters, the aquatic community is characterized by a native species dominated assemblage. It is important to note the varying degree to which a nonnative species can be characterized as a "nuisance" species. The many factors that determine a nonnative species' magnitude of infestation and impact are complex and not always well understood.

2.2.1 Aquatic Macrophytes

Some information exists on aquatic macrophyte communities in the mid-Columbia River system. Vegetation mapping in and around the Rocky Reach Reservoir (River Miles (RM) 473.6 to 515.5) identified 979 acres of aquatic macrophytes (Duke 2001) out of a total surface area of 8,167 acres (Duke 2001). Nonnative EWM represented 34 percent of the biomass samples

collected from within the Rocky Reach Reservoir (Duke 2001). In the Priest Rapids and Wanapum reservoirs, the composition of EWM in the aquatic macrophyte community was higher at 42 percent of littoral plant biomass (Normandeau et al. 2000).

In August and September 2005, Douglas conducted an aquatic macrophyte study in the Wells Reservoir. Sixty-one transects totaling 369 sample points were completed during the 2005 study (Lê and Kreiter 2005). Depths of up to 30 feet were sampled and sampling points along transects were completed at intervals of 5 feet or less. A total of nine aquatic plant species were documented (Table 2.2-1). Table 2.2-1 presents the percentage of samples in which each of the identified aquatic species was categorized as the dominant species (consisting of >60 percent of the sample composition). The two most dominant species in samples collected were common waterweed (*Elodea canadensis*) and leafy pondweed (*Potamogeton foliosus*) at 24.7 percent and 16.7 percent, respectively. Both of these species are native. EWM was dominant in only 6.3 percent of samples (Table 2.2-1). Samples with no plants (absent) consisted of 41.7 percent of all samples taken. This observation supports the concept that macrophyte communities maintain a patchy distribution.

Table 2.2-1 Aquatic macrophyte species identified and the frequency at which each of the species was considered the dominant species (consisting of >60 percent of the total sample) in a given sample during the Macrophyte Identification and Distribution Study, 2005 (Lê and Kreiter 2005).

Scientific Name	Common Name	Percentage of samples in which dominant
Chara spp.	Muskgrass	.003% (1/396)
Elodea canadensis	Common waterweed	24.7% (98/396)
Myriophyllum spicatum	Eurasian watermilfoil	6.3% (25/396)
Potamogeton crispus	Curly leaf pondweed	4.3% (17/396)
Potamogeton foliosus	Leafy pondweed	16.7% (66/396)
Potamogeton nodosus	American pondweed	1.3% (5/396)
Potamogeton pectinatus	Sago pondweed	0.8% (3/396)
Potamogeton zosteriformis	Flat-stemmed or eelgrass pondweed	2.3% (9/396)
Absent		41.7% (165/396)

Although EWM is present in the Project, the 2005 study indicated that it is not a dominant component of the Project aquatic plant community. During the Project study, EWM was often sub-dominant to several native species in samples collected. These contrasting observations between the Wells Reservoir and downstream reservoirs (Rocky Reach, Priest Rapids, and

Wanapum) where EWM was found to be the most abundant species are not clearly understood. One possible explanation may be that EWM, which is a species that can proliferate from plant fragments (Ecology 2001), has increased its ability to colonize due to potentially higher levels of disturbance in the downstream reservoirs as compared to the Wells Reservoir. The Rocky Reach Reservoir serves a larger population base, maintains an EWM removal program at recreational sites, and has higher levels of recreational use and development as compared to the Wells Reservoir. It is possible that these activities directly and indirectly re-mobilize EWM plant fragments and increase the potential for colonization in the Rocky Reach Reservoir as well as in downstream reservoirs (Lê and Kreiter 2005).

2.2.2 Aquatic Macroinvertebrates

In September and October 2005, Douglas conducted an aquatic invertebrate inventory and an assessment of the presence of rare, threatened, and endangered (RTE) aquatic invertebrates within the Wells Reservoir. The overall objective of the study was to document the distribution, habitat associations and qualitative abundance of the current aquatic invertebrate (e.g., clams, snails and insects) assemblage in the Wells Reservoir.

Samples were collected within representative habitats throughout the Wells Reservoir using an air lift suction device, Ponar grabs and colonization baskets. A total of 17 sites were sampled. In addition to the varied aquatic insects and worms found during the survey, approximately 20 species of freshwater mollusks were identified during the inventory from dredge samples (Table 2.3-1). Within the Methow, Okanogan and Columbia portions of the Wells Reservoir, 13, 11, and nine species of mollusks were present, respectively. Of the 20 species, 10 gastropods (snails) and 10 bivalves (clams, mussels) were identified. The gastropods included nine native species and one nonnative species (Big-ear radix, *Radix auricularia*). Similarly, the bivalves also included nine native species and one nonnative species (Asian clam, *Corbicula fluminea*) (BioAnalysts, Inc. 2006). The 2005 macroinvertebrate assessment did not discover the presence of any zebra mussels or quagga mussels within the Project.

2.2.3 Project Aquatic Nuisance Species Monitoring

In 2006, Douglas, in coordination with the Aquatic Nuisance Species Division of WDFW, began monitoring for zebra mussels and quagga mussels in Project waters. Activities consisted of monthly plankton tows to target mussel veligers at sites downstream of boat launches within the Wells Reservoir. Sampling activities were conducted during the summer and early fall when recreational boating activity is at a peak. Sampling protocols were provided by WDFW. All samples were sent back to WDFW for analysis. To date, none of the samples collected within the Project have contained any signs of zebra or quagga mussel presence.

In 2007, Douglas, in coordination with the Center for Lakes and Reservoirs at Portland State University, installed a permanent substrate sampler in the Wells Dam forebay to monitor for zebra and quagga mussel colonization within the Project. Douglas staff checks the substrate sampler monthly throughout the year as specified by the monitoring protocol. To date, no signs of zebra or quagga mussel presence have been detected. Both of these monitoring activities are ongoing.

Table 2.3-1 Mollusks collected from sampling stations on the Methow, Okanogan, and Columbia rivers during the 2005 Project Aquatic Macroinvertebrate Inventory.

Location	Common Name	Taxon
Methow River	Western pearlshell	*Margaritinopsis falcata*
	Striate fingernail clam	*Sphaerium striatinum*
	Ridgebeak peaclam	*Pisidium compressum*
	Western lake fingernail clam	*Musculium raymondi*
	Shortface lanx	*Fisherola nuttalli*
	Ashy pebblesnail	*Fluminicola fuscus*
	Western floater	*Anodonta kennerlyi*
	Ubiquitous peaclam	*Pisidium casertanum*
	Big-ear radix*	*Radix auricularia*
	Golden fossaria	*Fossaria obrussa*
	Prairie fossaria	*Fossaria (Bakerilymnaea) bulimoides*
	Ash gyro	*Gyraulus parvus*
		Corbicula sp.
Okanogan River	Western ridgemussel	*Gonidea angulata*
	Striate fingernail clam	*Sphaerium striatinum*
	Ridgebeak peaclam	*Pisidium compressum*
	Ubiquitous peaclam	*Pisidium casertanum*
	Asian clam*	*Corbicula fluminea*
	Ashy pebblesnail	*Fluminicola fuscus*
	Fragile ancylid	*Ferrissia californica*
	Ash gyro	*Gyraulus parvus*
	Western lake fingernail clam	*Musculium raymondi*
		Physella sp.
		Anodonta sp.
Columbia River	Western floater	*Anodonta kennnerlyi*
	Asian clam*	*Corbicula fluminea*
	Ridgebeak peaclam	*Pisidium compressum*
	Three ridge valvata	*Valvata tricarinata*
	Rocky Mountain physa	*Physella propinqua propinqua*
	Ash gyro	*Gyraulus parvus*
	Golden fossaria	*Fossaria (F.) obrussa*
	Prairie fossaria	*Fossaria (Bakerilymnaea) bulimoides*
	Big-ear radix*	*Radix auricularia*

*Nonnative taxon.

3.0 GOAL AND OBJECTIVES

The goal of the ANSMP is to prevent the introduction and/or spread of aquatic nuisance species in Project waters. Douglas, in collaboration with the Aquatic SWG, has agreed to implement several PMEs in support of the ANSMP. The PMEs presented within the ANSMP are designed to meet the following objectives:

Objective 1: Implement best management practices to prevent Eurasian watermilfoil proliferation during in-water (i.e., construction, maintenance and recreation improvements) improvement activities in the Project.

Objective 2: Continue participation in regional and state efforts to prevent the introduction and spread of aquatic nuisance species. Activities include continued monitoring for the presence of ANS, monitoring bycatch data collected during other aquatic management plan activities and conducting education outreach within the Project.

Objective 3: In response to proposed changes in the Project requiring FERC approval, the Aquatic SWG will assess the potential effects, if any, with respect to the introduction or proliferation of aquatic nuisance species in the Project to inform management decisions to support success of the ANSMP and will implement reasonable and appropriate measures to address any potential effects.

The ANSMP is intended to be compatible with other aquatic nuisance species management plans in the Columbia River mainstem. Furthermore, this management plan is intended to be supportive of the HCP, Bull Trout Management Plan, Pacific Lamprey Management Plan, Resident Fish Management Plan, White Sturgeon Management Plan, and Water Quality Management Plan by continuing to prevent the introduction and/or spread of aquatic nuisance species in Project waters. The ANSMP is intended to be not inconsistent with other management strategies of federal, state, and tribal natural resource management agencies.

The schedule for implementation of specific measures within the ANSMP is based on the best information available at the time the Plan was developed. As new information becomes available, implementation of each activity may be adjusted through consultation with the Aquatic SWG.

4.0 PROTECTION, MITIGATION AND ENHANCEMENT MEASURES

In order to fulfill the goals and objectives described in Section 3.0, Douglas, in consultation with the Aquatic SWG, has agreed to implement the following PMEs.

4.1 Implement Best Management Practices During Recreational Improvement Activities (Objective 1)

If at any time during the new license term, Douglas is required to construct, improve or maintain recreation access at boat launches and swim areas and the removal or disturbance of aquatic macrophtye beds that contain Eurasian watermilfoil may potentially occur, Douglas will implement containment efforts utilizing best management practices agreed to by the Aquatic SWG during such activities.

Douglas will implement the following best management practices (BMPs) to prevent the spread of ANS during contracted construction or maintenance of recreation enhancement measures:

For any contracted construction and maintenance activities requiring in-water work, Douglas will require, as part of construction bids, the inclusion of BMPs to address potential ANS threats. Prior to contract award, Douglas contract management staff will review and approve the sufficiency of proposed ANS BMPs with contractors and if necessary, require modifications in proposed ANS BMP implementation scope. Contractors will be instructed to share information with all sub-contractors prior to the start of work.

All equipment will undergo thorough inspection prior to entry into the Project to prohibit the introduction of ANS. Inspections will be carried out on construction equipment and watercraft at a staging area dedicated to equipment and watercraft cleaning. This site will be located away from the ordinary high water line and away from any storm drains that run into Project waters. Douglas will provide adequate training and information on ANS inspection and cleaning procedures to personnel responsible for inspections at field sites. An inspection process for vehicles and equipment that arrive onsite from other areas will be provided. Equipment from rental agencies, outside contractors, and managing partners will also be subject to inspection and cleaning. Precleaning inspections will be used to identify problem areas and determine whether hand removal of large accumulations of soil and debris is necessary before washing of equipment. Douglas will provide equipment necessary for conducting proper inspections.

Douglas will provide adequate training and information on ANS cleaning procedures to personnel responsible for cleaning watercraft and equipment. Specific information on cleaning of in-water equipment and watercraft will be provided. Special cleaning and decontamination protocols and methods will be required for equipment and watercraft that has been previously used in areas where zebra mussels and other Dreissendid species are present. Douglas will require that records of inspections and cleanings be provided for all watercraft and construction equipment used in or near project waters prior to, and after completion of construction projects. Inspection and cleaning records will include the location and date the watercraft or equipment was last used, date of inspection, findings of inspections, and the date and method used during the last cleaning. Inspection and cleaning records will be used to ensure that all watercraft and equipment has undergone proper inspection and cleaning before use in project waters.

4.1.1 Progress Towards Objective 1 in 2013

In 2013 modifications were made to section 4.1 of the ANSMP. Article 405 of the new FERC operating license for the Wells Project issued in November 2012 required that within 6 months of license issuance, Douglas PUD modify sections 4.1 of the existing ANSMP. The modifications required were:

(a) Section 4.1 of the plan must include specific best management practices that will be implemented to prevent the spread of aquatic nuisance species during construction of recreation enhancement measures.

In consultation with the Aquatic SWG, these modifications were made to the ANSMP and the updated plan was filed with FERC on April 30, 2013. The FERC approved the updated ANSMP on May 30, 2013. The approval of the plan also included a change in the reporting date for the ANSMP annual report from May 31 to April 1 for the preceding year's activities. The updated ANSMP is included in Appendix A.

No in-water construction activities took place during 2013. Aquatic vegetation control occurred on July 15, 2013 at the swimming areas located at Pateros, Brewster, and Bridgeport Parks. Liquid diquat dibromide was applied to control Elodea canadensis, Potamogeton pusillus, Myriophyllum spicatum, and Potomogeton crispus. Douglas PUD obtained all necessary permits and provided pre-application notice to the local communities.

4.2 Participation in Regional and State ANS Efforts (Objective 2)

4.2.1 Coordination with Regional and State Entities

Douglas shall continue to coordinate with regional and state entities to implement activities in Project waters to monitor for the presence of ANS, specifically zebra and quagga mussels. Activities covered by this objective will consist of monitoring for the presence of zebra and quagga mussels as is identified in Section 2.2.3. If ANS are detected during monitoring activities, Douglas will immediately notify the appropriate regional and state agencies and assist in the implementation of reasonable and appropriate measures to address the ANS presence as is consistent with ANS Management protocols.

In the event of positive identification of new ANS within the Project area, Douglas will conduct the following response activities:

• Douglas will immediately notify Ecology and WDFW of positive or suspected ANS species identified during monitoring and/or boat inspections. Photographs will be taken and sent to Ecology or WDFW for assistance in identification. If necessary, samples may also be collected for positive identification.

• Once the presence of ANS has been positively determined, Douglas will within 30 days of the positive identification (requiring confirmation by relevant agencies), begin monitoring at multiple sites throughout the Project to determine the extent and distribution of the new ANS

within the Project. Monitoring methods will vary depending on species and will be developed in consultation with the Aquatic SWG.

• If zebra mussels or other Dreissenid species are discovered in Project waters, Douglas will also notify upstream and downstream operators (Corps and Chelan PUD) and the Columbia River Basin Team. Douglas will help coordinate subsequent Columbia River Basin Team rapid response actions as applicable to the Project, such as implementing mandatory boat inspections, boat launch closures, quarantines, treatments, etc., in consultation with the Aquatic SWG.

• Douglas will work collaboratively with Ecology and WDFW, and in consultation with the Aquatic SWG, to develop an appropriate control response. Douglas will cooperate with the Columbia River Basin Team in implementing rapid response actions. It is anticipated that the Columbia River Basin Team will use up to the date technical information to guide decisions. The Columbia River Basin Team is also expected to follow the protocols contained within the 100th Meridian Initiative (Heimowitz and Phillips 2011) as it applies to the containment of zebra and other Dreissenid species.

• Appropriate information will also be provided to the public about any new ANS observations. Up-to-date outreach will be provided the public with information about the presence and distribution of the ANS in Project waters, and on the appropriate measures being implemented to prevent the proliferation of the species.

• After initial response efforts are conducted, Douglas will assist the Columbia River Basin Team in implementing control and/or eradication actions as appropriate based on the location, extent, and type of ANS identified. The Aquatic SWG will be consulted when selecting control and eradication methods.

Douglas shall participate in information exchanges and regional efforts to coordinate monitoring activities.

4.2.1.1 Progress Towards Objective 2 in 2013

In 2013, modifications were made to section 4.2.1 of the ANSMP. Article 405 of the new FERC operating license for the Wells Project issued in November 2012 required that within 6 months of license issuance, Douglas PUD modify section 4.2.1 of the existing ANSMP. The modifications required were:

Section 4.2.1 of the plan must include specific reasonable and appropriate measures that are consistent with aquatic nuisance species management protocols and will be implemented, if aquatic nuisance species are detected during monitoring activities at the project.

In consultation with the Aquatic SWG, these modifications were made to the ANSMP and the updated plan was filed with FERC on April 30, 2013. The FERC approved the updated ANSMP on May 30, 2013. The approval of the plan also included a change in the reporting date for the ANSMP annual report from May 31 to April 1 for the preceding year's activities. The updated ANSMP is included in Appendix A.

As similar to previous years, Douglas coordinated zebra and quagga mussel monitoring with WDFW during 2013. Veliger tows and monitoring of artificial substrate samplers occurred monthly July-October at three sites in the Wells Reservoir. These sites included the Pateros winter boat launch and the mouth of the Methow River, Brewster boat launch, and Bridgeport boat launch. Veliger tow samples collected were sent to WDFW for analysis. Results from sample analysis determined no presence of zebra or quagga mussel veligers. In addition, no adult mussels were observed on artificial substrate samplers. Douglas PUD will continue to monitor for these species in 2014 in consultation with the Aquatic SWG.

4.2.2 Monitor Bycatch from other Project Aquatic Resource Management Activities

Douglas shall monitor bycatch data collected from ongoing Project aquatic resource management activities for aquatic nuisance species presence to support regional and state efforts and the ANSMP. Such ongoing activities may consist of broodstock collection activities at Wells Dam and in associated Project tributaries, the northern pikeminnow removal program, water quality monitoring and any other aquatic resource activities related to implementation of Aquatic Resource Management Plans for bull trout, Pacific lamprey, white sturgeon, and resident fish.

4.2.2.1 Progress Towards Objective 2 in 2013

Douglas monitored bycatch for aquatic nuisance species during aquatic resource management activities in 2013. Specific activities in which monitoring of bycatch occurred included: the subyearling Chinook life-history study, northern pikeminnow removal program, temperature station monitoring, and the crayfish monitoring (Table 4.2-1).

Table 4.2-1. Non-native aquatic species observed as bycatch during resource management activities in the Wells Project during 2013.

Species	Number Observed	Disposition	Activity	Date
Brown bullhead (*Ameiurus nebulosus*)	12	Released alive	Northern pikeminnow removal program	April-November
Smallmouth bass (*Micropterus dolomieu*)	10	Released alive	Subyearling Chinook life-history study	July
Common carp (*Cyprinus carpio*)	5	Released alive	Subyearling Chinook life-history study	July
Yellow perch (*Perca flavescens*)	5	Released alive	Subyearling Chinook life-history study	July
Largemouth bass (*Micropterus salmoides*)	2	Released alive	Subyearling Chinook life-history study	July
Bluegill (*Lepomis macrochirus*)	1	Released alive	Subyearling Chinook life-history study	July
Northern crayfish (*Orconectes virilis*)	16	Destroyed	Crayfish monitoring	September

4.2.3 ANS Information and Education

Douglas shall make information regarding the effects of ANS introductions and the importance of prevention available to the public. Such outreach activities may consist of posting signage at Project recreation areas and boat launches.

Douglas shall also provide literature produced by appropriate state entities (Ecology and WDFW) for distribution at the visitor centers of local communities of the Project (Pateros, Brewster, Bridgeport) including Wells Dam.

4.2.3.1 Progress Towards Objective 2 in 2013

In 2013, Douglas maintained ANS signage at all public boat launch facilities in the Wells Project, as part of new license requirements. Signs included information about preventing the spread of ANS. Douglas also provided educational literature in the form of surveys, brochures and fact sheets on ANS prevention measures and the risks of ANS introductions. Examples of the ANS signage and education and outreach materials are included in Appendix C. This information was made available to the public in May 2013 at public use facilities and visitor centers. Locations where ANS education and outreach materials were made available to the public include: the Wells tailrace boat launch, the Wells Dam overlook, Starr boat launch, Pateros boat launch, Brewster boat launch, and Bridgeport boat launch (Figure 4.2-1). In the fall of 2013, brochures were replenished at public use facilities and surveys were collected from public use areas. Four surveys were collected in November 2013; however, they were not fully completed. Douglas will continue to make this information available and monitor survey responses in 2014.

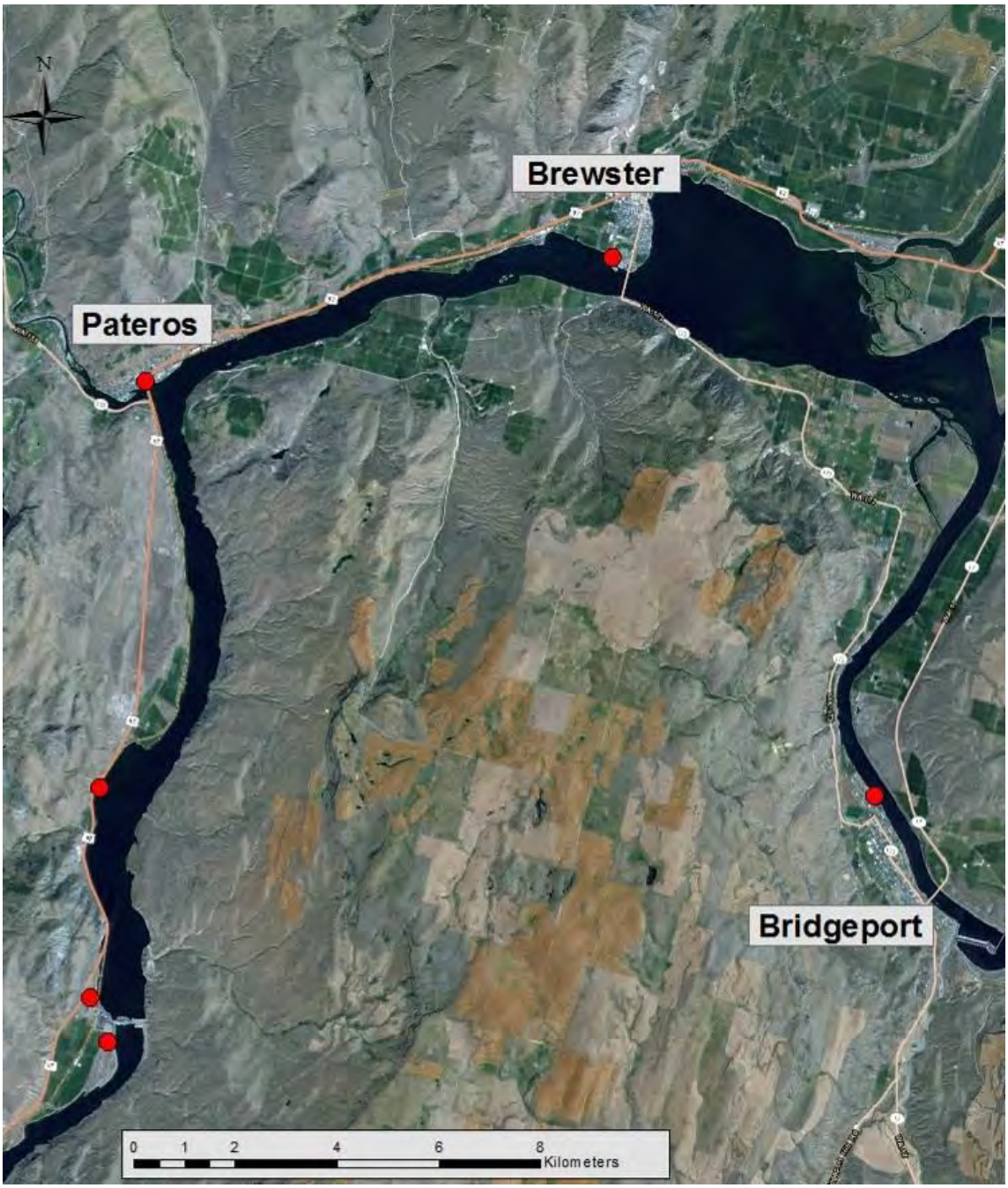

Figure 4.2-1. Locations in the Wells Project where ANS education and outreach materials are made available to the public. Red circles indicate specific locations where materials are available year-round.

4.3 Monitor and Address ANS Effects to Aquatic Communities During Changes in Project Operations (Objective 3)

If at any time during the new license term, future changes in Project operations requiring FERC approval are proposed and the Aquatic SWG concludes that such proposed operations may encourage the introduction or proliferation of aquatic nuisance species within the Project, the Aquatic SWG will assess the potential effects, if any, in order to make informed management decisions.

If the assessment identifies adverse effects to Aquatic Resources due to aquatic nuisance species attributable to changes in Project operations, Douglas shall consult with the Aquatic SWG to select and implement reasonable and appropriate PMEs to address the identified adverse effect(s).

4.3.1 Progress Towards Objective 3 in 2013

No significant changes in Project operations occurred in 2013.

4.4 Reporting

Douglas will provide a draft annual report to the Aquatic SWG summarizing the previous year's activities undertaken in accordance with the ANSMP. The report will document all ANS activities conducted within the Project. Furthermore, any decisions, statements of agreement, evaluations, or changes made pursuant to this ANSMP will be included in the annual report. If significant activity was not conducted in a given year, Douglas will prepare a memorandum providing an explanation of the circumstances in lieu of the annual report.

Consistent with the FERC License Order for Wells Dam, the Wells Dam Water Quality 401 Certification, and ANSMP, this report will be updated annually with the assistance of the Aquatic SWG. Each year the report will be filed on or prior to April 1st. The report will include a summary of the progress made towards the implementation of the ANSMP and focus on the previous year's developments.

5.0 REFERENCES

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APPENDICES

APPENDIX A

FERC APPROVED UPDATED ANSMP INCLUDING NEW BMPS

APPENDIX B

FERC APPROVAL LETTER OF UPDATED ANSMP

APPENDIX C

AQUATIC NUISANCE SPECIES SIGNAGE AND EDUCATION AND OUTREACH MATERIALS


STOP
Harmful
Species
Unwanted plants and animals can ruin
your favorite fishing and boating waters.
Transom
Well
Live Well
Anchor
Rollers
Lower Unit Propeller
Axle
PLEASE!
• Remove ALL aquatic plants and animals.
• Drain water from your boat, trailer, tackle and gear before leaving the area.
• Do NOT empty aquariums or bait.
Unlawful to transport aquatic weeds, zebra mussels, or other aquatic nuisance species.
(RCW 77.12.020 RCW 17.24.081 WAC 16-752-510 WAC 232-12-01701)
To Report Sightings or for more information, please contact one of these agencies:
(360) 902-2200
(360) 407-6562
(360) 586-6599
(360) 753-9440

STOP AQUATIC HITCHHIKERS!

www.ProtectYourWaters.net

Follow these simple steps:

☑Clean

Remove all plants, animals, mud and thoroughly wash everything, especially all crevices and other hidden areas.

☑Drain

Eliminate all water before leaving the area, including wells, ballast, and engine cooling water.

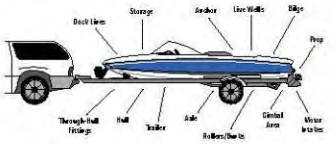
☑Dry

Allow sufficient time for your boat to completely dry before launching in other waters.

If your boat has been in infested waters for an extended period of time, or if you cannot perform the required steps above, you should have your boat *professionally* cleaned with high-pressure scalding hot water (>140 °F) before transporting to any body of water.

Before launching and before leaving...

Inspect everything!



Quagga mussels encrusting a boat motor

100th Meridian Initiative

ZAP THE ZEBRA

www.100thmeridian.org

Zebra and quagga mussels are a nuisance for anglers and boaters. They can ruin your equipment, clog motor cooling systems, foul hulls, and jam the centerboard wells under sailboats.

Please report any sighting by calling our National Hotline:

1-877-STOP-ANS

1-877-786-7267

Image Credits: *Zebra Mussels on a Fishing Lure*(c) Mark Murrell, Kansas Department of Wildlife and Parks • *Zebra Mussels, Zebra Mussels on a Bear Can, Zebra Mussels on a Native Mussel, Bait Bucket, Quagga Mussels, Zebra/Quagga Mussel Comparison* January 2009 (c) David Britton, U.S. Fish & Wildlife Service • *Zebra Mussels in a Cut-Away Pipe* by Don Schloesser, Great Lakes Science Center • *Zebra Mussels in a Pipe* by Craig Czarnecki, Michigan Sea Grant • *Quagga Mussels Encrusting a Boat Motor* by Matt Watson, The University of Texas at Arlington • The distribution maps are based on data compiled by the U.S. Geological Survey's Nonindigenous Aquatic Species Program (http://nas.er.usgs.gov).

Invasive Mussels: Expensive Damage!

When zebra and/or quagga mussels invade our local waters they clog power-plant and public-water intakes and pipes. Routine treatment is necessary and very expensive. This leads to increased utility bills. If you use water and electricity, you do not want these mussels.

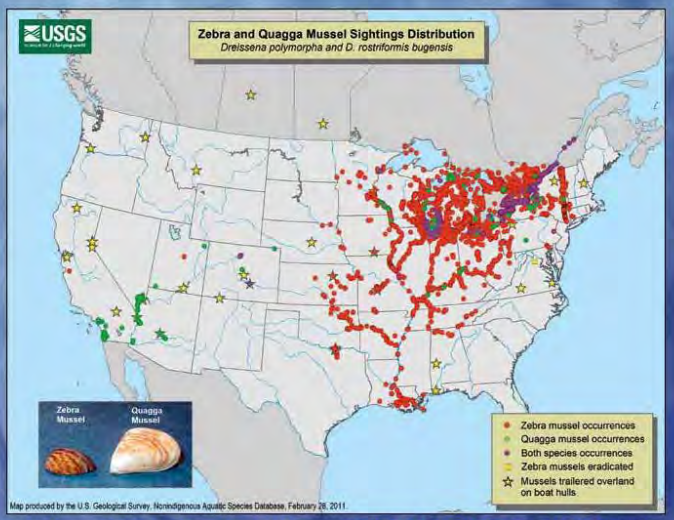
Zebra mussels in a cut-away pipe

Zebra mussels blocking a pipe

Zebra/Quagga Mussels May Use Your Boat to Invade Additional Waters!

Once a boat has been in infested waters, it could carry invasive mussels. These mussels can spread to new habitats on boats trailered by commercial haulers or the public. Zebra and quagga mussels attach to boats and aquatic plants carried by boats. These mussels also commonly attach to bait buckets and other aquatic recreational equipment. An adult female zebra mussel can release up to a million eggs in a year. Please take precautions outlined in this brochure to help reduce the chance that zebra or quagga mussels will spread from your boat or equipment to uninfested areas.

Before zebra mussels *After zebra mussels*



Zebra/Quagga Mussels Harm Native Aquatic Life

Zebra mussels on a crayfish

Zebra mussels on a native mussel

Zebra/Quagga Mussels Encrust Any Hard Surface

Zebra mussels on a bear can

Zebra mussels on a fishing lure

Zebra Mussels / Quagga Mussels

What are they?

Both are closely related, invasive, freshwater bivalve (mollusk) species that encrust hard surfaces.

Where do they come from?

These species came from the Black and Caspian Sea Drainages in Eurasia.

What size are they?

Larvae are microscopic and adults may be up to two inches long. They are usually found in clusters.

Why "Zebra" mussels?

Both species are sometimes referred to as "zebra" mussels because they both have light and dark alternating stripes. Quagga mussels are actually a distinct (but similar) species named after an extinct animal related to zebras.

STOP AQUATIC HITCHHIKERS!™

Prevent the transport of nuisance species.
Clean all recreational equipment.

When you leave a body of water:

- Remove any visible mud, plants, fish or animals before transporting equipment.
- Eliminate water from equipment before transporting.
- Clean and dry anything that comes into contact with water (boats, trailers, equipment, clothing, dogs, etc.).
- Never release plants, fish or animals into a body of water unless they came out of that body of water.

STOP AQUATIC HITCHHIKERS!™

Place Holder for Customizable Logo

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STOP AQUATIC HITCHHIKERS!™

Place Holder for Customizable Logo

STOP AQUATIC HITCHHIKERS!

100th Meridian Initiative

Interview/Inspection Form for Trailered Boats and Aquatic Invasive Species

Site Information

Douglas County Public Utility District No. 1

Date: Time:

Water Body: State:

Specific Location:

Boater Information

Home State: Zip:

Was the boat commercially hauled? O Yes O No

Do you always launch in the same water body? O Yes O No

How many times have you launched this year?

How often do you clean your boat?
- O After every launch
- O After a few launches
- O Ocassionally
- O Never

Boat cleaning method:
- O Car wash/High pressure
- O Home/Hand Wash
- O Professional Cleaning
- O Not Applicable

Do you keep your boat moored or in a slip? O Yes O No

If so, where?

Boat direction (coming or going):

Boat Type:
- O Angling
- O Pleasure
- O Pontoon
- O Jetski/PWC
- O Canoe/Kayak
- O Houseboat
- O Other

Boat/Trailer Condition:
- O Clean & Dry
- O Dirty or Wet

Knowledge/Action Information

Have you heard of zebra/quagga mussels? O Yes O No How?

Have zebra/quagga mussels impacted you? O Yes O No How?

Have you heard of other aquatic invasives? O Yes O No How?

Have any aquatic invasive species affected you? O Yes O No How?

Did you inspect your boat for aquatic invasive species today? O Yes O No How?

Would you wash your boat if a public washing facility was available nearby? O Yes O No

Has anyone asked you about zebra/quagga mussels before? O Yes O No

If so, who? If so, when?

Have you ever considered changing destinations to avoid AIS issues? O Yes O No

Destination Information

Where else do you take the boat that you are using today?

Water Body:	State:	O Been There	O Going There
Water Body:	State:	O Been There	O Going There
Water Body:	State:	O Been There	O Going There
Water Body:	State:	O Been There	O Going There

Boat Inspection

Aquatic Invasives Found? O Yes O No If yes, what species?

If yes, where was it found?

Comments