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May 22, 2015

Kimberly D. Bose. Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12
888 First Street, N.E.
Washington, D.C. 20426

Re: Priest Rapids Hydroelectric Project No. 2114-211 - Article 401(a)(22) – 2014 Aquatic Invasive Species Control and Prevention Plan Annual Report

Dear Secretary Bose,

Please find enclosed Public Utility District No. 2 of Grant County, Washington's (Grant PUD) annual report of the 2014 Aquatic Invasive Species Control and Prevention Plan Program (AISP Program) activities consistent with the requirements of the Aquatic Invasive Species Control and Prevention Plan (AISP), Article 401(a)(22) of the Priest Rapids Hydroelectric Project License (P-2114) and associated obligations and mandates, including the Washington Department of Ecology (WDOE) 401 Water Quality Certification. The AISP Program activities for 2014 were conducted in accordance with the management plan titled, *Aquatic Invasive Species Control and Prevention Plan* (Grant PUD 2010), which was developed in consultation with the Priest Rapids Fish Forum (PRFF), the Washington Department of Fish and Wildlife's (WDFW's) Aquatic Invasive Species Program and the WDOE's Freshwater Aquatic Weed Control Program. The AISP was submitted to Federal Energy Regulatory Commission (FERC) on March 3, 2010 and approved on July 7, 2010.

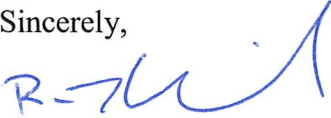
Grant PUD prepared and disseminated a draft summary of the 2014 Aquatic Invasive Species Control and Prevention Program activities for comment on February 26, 2015 to WDOE, WDFW and to members of the PRFF which includes U.S. Fish & Wildlife Service, Colville Confederated Tribes, Yakama Nation, the Columbia River Inter-Tribal Fish Commission, Bureau of Indian Affairs, and the Confederated Tribes of the Umatilla Indian Reservation. Comments on the draft summary were due April 1, 2015. Both electronic and written comments were received from WDFW and WDOE, respectively and were incorporated into the final annual report.. The annual AISP meeting was held on April 23, 2015. The meeting generally followed the agenda provided (Appendix J). A PowerPoint was presented by Grant PUD on the results from the 2014 season and the planned efforts for 2015. No modifications were deemed necessary by Grant PUD or the stakeholders for the 2015 implementation season. The next meeting was scheduled for the spring of 2016 after the implementation of the 2015 monitoring and educational season. Grant PUD will continue implementation in 2015 in accordance with the AISP that was approved by FERC on July 7, 2010.

All comments received are included in Appendix K of the final annual report and a comment summary and response table is also included in Appendix L of the final summary report.

Bose (AIS Annual Report)
May 22, 2015
Page 2 of 2

FERC staff with any questions should contact Fish, Wildlife, and Water Quality Manager Tom Dresser at 509-754-5088, ext. 2312 or email tdresse@gcpud.org.

Sincerely,



Ross Hendrick
License Compliance Manager

CC: Patrick McGuire – WDOE
James Bellatty – WDOE
Patrick Verhey - WDFW

Priest Rapids Hydroelectric Project (P-2114)

**AQUATIC INVASIVE SPECIES
CONTROL AND PREVENTION PLAN:
2014
ANNUAL REPORT**

License Article 401(a)(22)

By Carson Keeler

Public Utility District No. 2 of Grant County, Washington
Priest Rapids Hydroelectric Project
FERC Project No. 2114

May 2015

Executive Summary

The Aquatic Invasive Species Control and Prevention Program (AISP Program) activities for 2014 were conducted in accordance with the management plan titled, *Aquatic Invasive Species Control and Prevention Plan* (AISP; Grant PUD 2010). The AISP was developed by the Public Utility District No. 2 of Grant County, Washington (Grant PUD) in consultation with the Priest Rapids Fish Forum (PRFF), the Washington Department of Ecology's (WDOE's) Freshwater Aquatic Weed Control Program, the Washington Department of Fish and Wildlife's (WDFW's) Aquatic Invasive Species Program, and in accordance with Section 6.6.4 of the WDOE 401 Water Quality Certification (WQC; WDOE 2007) and License Article 401(a)(22) of the Federal Energy Regulatory Commission's (FERC's) license for operation of the Priest Rapids Hydroelectric Project (Project; FERC 2008). The AISP was submitted to FERC on March 3, 2010 and approved by FERC on July 7, 2010.

Key components of the AISP include education and monitoring that are designed to help manage, regulate, and potentially prevent introduction and/or spread of existing/new aquatic invasive species (AIS) within the Project.

For a majority of 2014, the Wanapum Reservoir was drawn down more than 20 feet below its normal minimum operating level (and up to 26 feet below its normal operating levels) for repairs to be made to the spillway sections of Wanapum Dam (a fracture was discovered in February of 2014 and the reservoir behind Wanapum Dam was lowered to prevent further damage). Furthermore, due to the fracture and associated drawdown, the entire Wanapum Reservoir was closed to the public, including all boat launches and recreation sites, for safety and cultural protection reasons. This unanticipated drawdown stranded a number of relatively immobile benthic organisms, including freshwater mussels, snails, fishes, and other organisms. In response, Grant PUD initiated land- and water-based surveys to characterize benthic communities potentially affected by the water-level reduction in the Wanapum Reservoir. This incident provided a unique opportunity to perform surveys in areas previously submerged within the Wanapum Reservoir, to estimate species composition and densities of stranded freshwater mollusks (mussels, clams, and snails) and to search for any potential AIS species of concern. Included in these survey efforts was the potential to find AIS, including zebra/quagga mussels, and New Zealand mud snails (NZMS). Twelve taxa of snails and seven species of bivalve, including three native freshwater mussels and one non-native clam were found in the Wanapum Reservoir. No zebra/quagga mussels or NZMS were encountered during these survey efforts. Additionally, because of the drawdown conditions in Wanapum Reservoir, some of the educational and monitoring components of the AISP Program were limited to the Priest Rapids Reservoir of the Project. For instance, boater surveys/self-surveys were conducted solely within the Priest Rapids Reservoir and exclusively at the Priest Rapids Recreational Area (PRRA or Desert Aire) boat launch. Lastly, boat launch transect monitoring were only conducted within the Priest Rapids Reservoir at the Lower Wanapum, Huntzinger (new for 2014), Buckshot, and the PRRA/Desert Aire boat launches. Not only was the Wanapum Reservoir closed for a majority of 2014 to recreational activities, but any boat launch transect monitoring would not have been consistent with past and/or future monitoring results and thus not representative of "normal" water levels and aquatic plant presence/absence.

Educational activities for 2014 included placement of outreach materials and signage at four Project boat launches (only in the Priest Rapids Reservoir), placement of outreach material at major recreational outlet stores, a poster presentation and outreach material distributed at Grant

PUD's Archaeology Days, and conducting voluntary boater surveys at the PRRA boat launch during high-use periods (Memorial Day, 4th of July, and Labor Day weekends).

Boater surveys/self-surveys were conducted on a total of forty-nine boats. Cities of residence were varied throughout and included Mattawa/Desert Aire (seven instances), Yakima (four instances), Kirkland, Renton, Auburn, Seattle, Monroe, Ellensburg, and Royal City (two instances each), with all other cities as single occurrences. Waterbodies noted as having "been there" or "going there" during survey efforts included Lake Roosevelt (five times), Lake Washington and the Columbia River (six times), Moses Lake, Potholes Reservoir and Banks Lake (three times), Klickitat River, Puget Sound and the Snake River (two times), with all other waterbodies noted once. No interviewees were noted as having AIS present on their vessel and/or trailer.

Monitoring activities during 2014 consisted of zebra/quagga mussel sampling (Project-wide), and invasive aquatic plant surveys along with passive-monitoring of riparian/wetland invasive plants conducted at Priest Rapids Reservoir boat launches. Included in the 2014 monitoring activities was the aforementioned benthic survey in the Wanapum Reservoir.

Results from the monitoring efforts in 2014 reported no zebra/quagga mussel veliger identified in any samples and no presence of zebra/quagga mussels or other macroinvertebrate AIS including NZMS on any artificial substrates within the Project, or during the benthic survey efforts. Eurasian milfoil was present at all but one of the boat launches surveyed in 2014. Lower Wanapum did not have any submergent vegetation, which is consistent with previous survey results. However, Eurasian milfoil was rarely dominant (at only one transect point at the Huntzinger boat launch) and boat launches were generally dominated by native species. Curlyleaf pondweed was present at two of the four boat launches (Huntzinger and PRRA) and was never dominant. Native species observed at boat launch transects typically included the following species, which were not recorded on a point-specific basis: coontail (*Ceratophyllum demersum*), common waterweeds (*Elodea* spp.), and native pondweed species (*Potamogeton* spp.). Transect results from 2014 are generally consistent with data gathered in 2013. Eurasian milfoil had a similar distribution as in 2013, with presence at the same launches (of those surveyed in 2014) and rarely exhibiting dominance. Curlyleaf pondweed was observed somewhat less in 2014 than this species had been in previous years. For example, it was not observed at the Buckshot boat launch in 2014, as it had been in previous years and, though present at PRRA, it did not exhibit dominance in 2014 as it had in prior years. As with prior years, native species remain dominant at most transect points at most boat launches. In 2014, native species were dominant at all transect points that had vegetation except one, which occurred at Huntzinger and was dominated by Eurasian milfoil.

Local and regional coordination activities in 2014 involved participation in the Columbia River Basin Team (CRBT) meeting and hosting Grant PUD's Annual Aquatic Invasive Species meeting.

The annual AIS meeting was held on April 23, 2015. No modifications were deemed necessary by Grant PUD or the stakeholders for the 2015 implementation season. Grant PUD will continue implementation in 2015 in accordance with the AISP that was approved by FERC on July 7, 2010.

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Terms and Abbreviations

AIS	Aquatic Invasive Species
AISP	Aquatic Invasive Species Control and Prevention Plan
AISP Program	Aquatic Invasive Species Control and Prevention Plan Program
CDFG	California Department of Fish and Game
CRBT	Columbia River Basin Team
FERC	Federal Energy Regulatory Committee
Grant PUD	Public Utility District No. 2 of Grant County, Washington
GeoEngineers	GeoEngineers, Inc.
GIS	Geographic Information Systems
GPS	Global Positioning System
license	FERC license
NZMS	New Zealand Mudsail
OHWM	Ordinary High Water Mark
PRFB	Priest Rapids Fish Bypass
PRFF	Priest Rapids Fish Forum
PRRA	Priest Rapids Recreation Area
Project	Priest Rapids Hydroelectric Project
RM	River Mile
USFWS	United States Fish and Wildlife Service
VMP	Vegetation Management Plan
WFB	Wanapum Fish Bypass
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology
WQC	Water Quality Certification

1.0 Introduction

The Public Utility District No. 2 of Grant County, Washington (Grant PUD) owns and operates the Priest Rapids Hydroelectric Project (Project), located along the mid-Columbia River in central Washington State. The Project is authorized by the Federal Energy Regulatory Commission (FERC) under Project No. 2114¹ and includes the Wanapum and Priest Rapids developments. A 401 Water Quality Certification (WQC) for the operation of the Project was issued by the Washington Department of Ecology (WDOE) on April 3, 2007 (WDOE 2007) and amended on March 6, 2008. The 401 WQC's terms and conditions were directly incorporated into the FERC license (license) to operate the Project issued on April 17, 2008 (FERC 2008).

The Aquatic Invasive Species Control and Prevention Program (AISP Program) activities for 2014 were conducted in accordance with the management plan titled, *Aquatic Invasive Species Control and Prevention Plan* (AISP; Grant PUD 2010). The AISP was developed by Grant PUD in consultation with the Priest Rapids Fish Forum (PRFF), the WDOE's Freshwater Aquatic Weed Control Program, the Washington Department of Fish and Wildlife's (WDFW's) Aquatic Invasive Species Program, and in accordance with Section 6.6.4 of the 401 WQC (WDOE 2007) and Article 401(a)(22) of the license (FERC 2008). The AISP was submitted to FERC on March 3, 2010 and approved by FERC on July 7, 2010.

For the majority of 2014, the Wanapum Reservoir was drawn down more than 20 feet below its normal minimum operating level (and up to 26 feet below its normal operating level) for repairs to be made to the spillway sections of Wanapum Dam (a fracture was discovered in February of 2014 and the reservoir behind Wanapum Dam was lowered to prevent further damage). This unanticipated drawdown stranded a number of relatively immobile benthic organisms, including freshwater mussels, snails, fishes, and other organisms. In response, Grant PUD initiated land- and water-based surveys to characterize benthic communities potentially affected by the water-level reduction in the Wanapum Reservoir. This incident provided a unique opportunity to perform surveys in areas previously submerged within the Wanapum Reservoir, to estimate species composition and densities of stranded freshwater mollusks (mussels, clams, and snails) and to search for any potential AIS species of concern. Included in these survey efforts was the potential to find AIS, including zebra/quagga mussels, and New Zealand mud snails (NZMS). Twelve taxa of snails and seven species of bivalve, including three native freshwater mussels and one non-native clam were found in the Wanapum Reservoir. No zebra/quagga mussels or NZMS were encountered during these survey efforts. Additionally, because of the drawdown conditions of Wanapum Reservoir, some educational and monitoring components of the AISP Program were limited to the Priest Rapids Reservoir of the Project. For instance, boater surveys/self-surveys was conducted solely within the Priest Rapids Reservoir and almost exclusively at the Priest Rapids Recreational Area (PRRA or Desert Aire boat launch). Lastly, boat launch transect monitoring was only conducted within the Priest Rapids Reservoir at the Lower Wanapum, Huntzinger (new for 2014), Buckshot, and PRRA boat launches. Not only was the Wanapum Reservoir closed for a majority of 2014 to recreational activities, any boat launch transect monitoring would not have been consistent with past and/or future monitoring results and thus not representative of "normal" water levels and aquatic plant presence/absence.

This annual report summarizes activities conducted during implementation year 2014 under the AISP Program.

¹ 123FERC ¶61,049

1.1 Objectives

As stated in the AISP (Grant PUD 2010), the primary objective is to address methods to monitor and manage aquatic invasive flora and fauna in the Project. Key components of the AISP include education and monitoring that are designed to help manage, regulate, and potentially prevent introduction and/or spread of new/existing aquatic invasive species (AIS) within the Project.

1.2 Priest Rapids Hydroelectric Project Description

The downstream boundary of the Project is located approximately three miles below Priest Rapids Dam (river mile [RM] 397.1) and extends upriver to the Rock Island Dam tailrace at RM 453.5 (Figure 1).

The Priest Rapids development consists of a 7,725-acre reservoir and a 10,103-foot-long by 179.5-foot-high dam spanning the Columbia River. The dam consists of left and right embankment sections; left and right concrete gravity dam sections; a left and right fish passage structure, each with an upstream fish ladder; a gated spillway section; a downstream fish passage structure (Priest Rapids Fish Bypass (PRFB)); and a powerhouse containing ten vertical shaft integrated Kaplan turbine/generator sets with a total authorized installed capacity (best gate) of 675 MW (Figure 2).

The Wanapum development consists of a 14,680-acre reservoir and an 8,637-foot-long by 186.5-foot-high dam spanning the Columbia River. The dam consists of left and right embankment sections; left and right concrete gravity dam sections; a left and right fish passage structure, each with an upstream fish ladder; a gated spillway; a downstream fish passage structure (Wanapum Fish Bypass (WFB)); and a powerhouse containing ten vertical shaft integrated Kaplan turbine/generator sets with a total authorized installed capacity (best gate) of 735 MW (Figure 3).

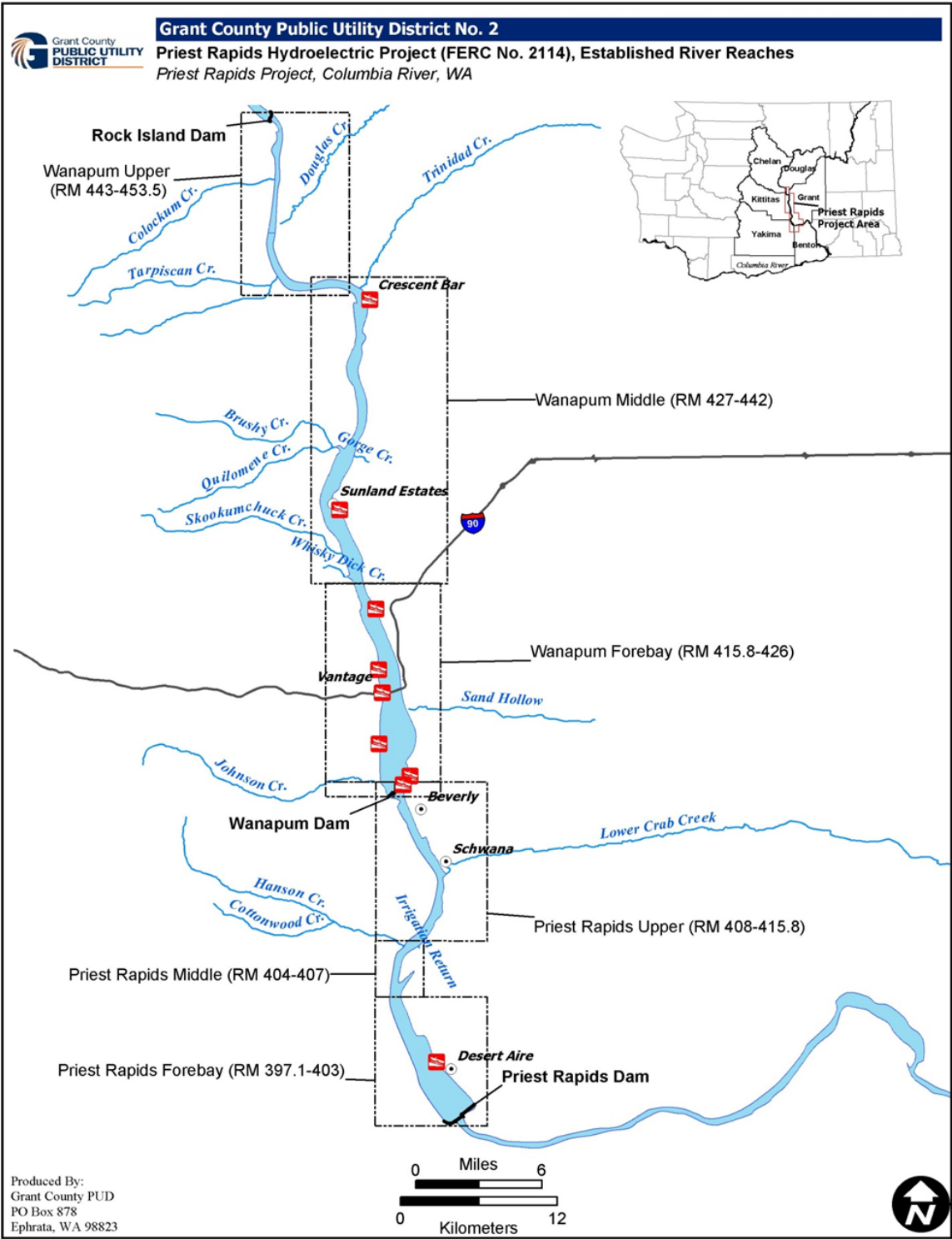


Figure 1 The Priest Rapids Hydroelectric Project and established river reaches presented by river mile (RM), mid-Columbia River, WA.

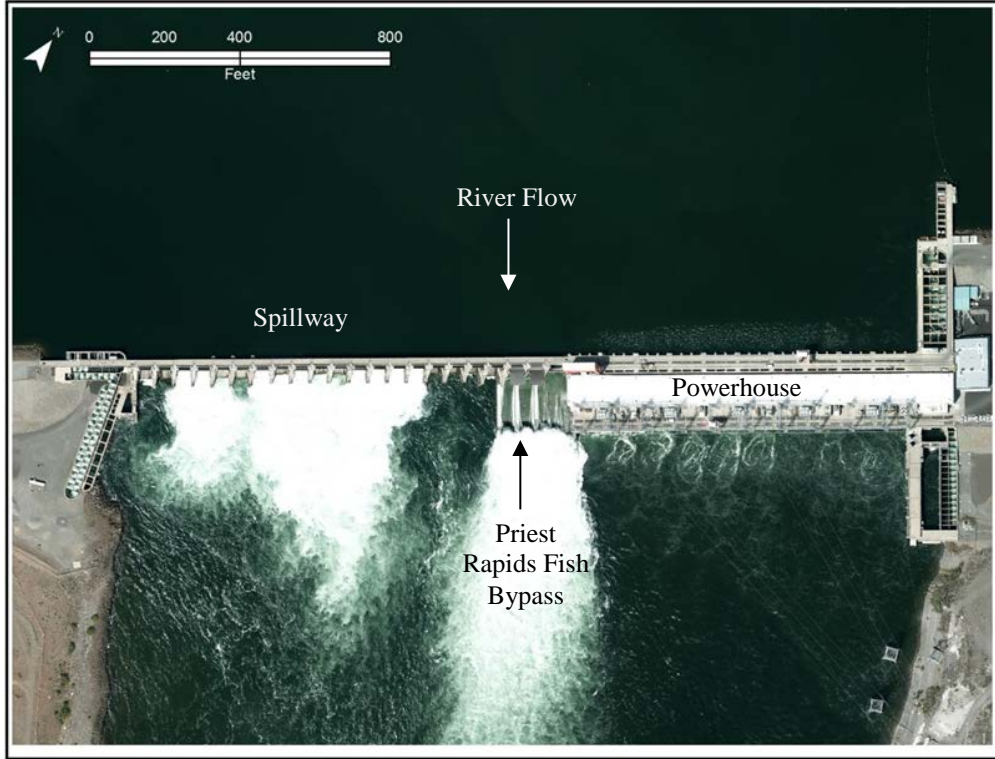


Figure 2 Aerial photograph of Priest Rapids Dam, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.



Figure 3 Aerial photograph of Wanapum Dam, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

2.0 Activities

The following sections provide a summary of the activities conducted in 2014 for the AISP, which included elements of education, monitoring, and local and regional coordination. Each of these activities is discussed below in more detail.

2.1 Education

The educational activities implemented as part of the AISP for 2014 included placement of outreach materials and educational signage at four Project boat launches (only in Priest Rapids Reservoir), placement of outreach material at major recreational outlet stores, a poster presentation and outreach materials distributed at Grant PUD's Archaeology Days, and voluntary boater surveys conducted during high-use times (Memorial Day, 4th of July, and Labor Day weekends). These educational activities are discussed in more detail in the following sections.

2.1.1 Outreach Material and Educational Signage

Four Project boat launches were supplied with outreach materials and educational signage prior to the Memorial Day holiday (May 24, 2014). As stated above (see Section 1.0), the Wanapum Reservoir was operated at a drawn down level during the 2014 recreational season. Therefore, all Project boat launches within the Wanapum Reservoir were closed to the public and thus not supplied with outreach materials. Supplied boat launches were solely located within the Priest Rapids Reservoir and consisted of the Lower Wanapum, Huntzinger (new for 2014), Buckshot, and Desert Aire (Priest Rapids Recreation Area (PRRA)) on the Priest Rapids Reservoir. Outreach materials consisted of the 100th Meridian Initiative's *Zap the Zebra* brochure (100th Meridian Initiative 2011; Appendix A) and boater self-survey forms (100th Meridian Initiative 2011a; Appendix B). Educational signage was comprised of the WDFW's AIS poster (WDFW 2011; Appendix D) and the WDOE advisory poster for Eurasian watermilfoil (WDOE 2011; Appendix E) (see **Error! Reference source not found.**).

Also, prior to May 1, recreational outlet stores and/or businesses were supplied with outreach material (in the form of the *Zap the Zebra* brochure) for distribution, which included the Wal-Mart[®] sporting goods sections in Ephrata and Moses Lake, Washington, Tri-State Outfitters in Moses Lake, Washington, Big Wally's near Banks Lake, MarDon Resort on the Potholes Reservoir, and Pollywog's in Desert Aire, Washington. Furthermore, outreach materials were distributed (in the form of the *Zap the Zebra* brochure, WDFW's *Stop Aquatic Invasive Species* float keychain, and the United States Fish and Wildlife Service's (USFWS's) *Stop Aquatic Hitchhikers!* stickers) and an AIS poster (titled "*AIS in the Priest Rapids Hydroelectric Project*;" Appendix F) were presented at Grant PUD's annual Archaeology Days.

It is important to note that all Grant PUD Project boat launches, including newly developed launches that are in the process of being updated and/or constructed, will be outfitted with kiosks that will contain information about boater safety, boater regulations, recreational opportunities, wildlife, and AIS within the Project. All Project boat launches during 2014 consisted of the configuration of outreach materials and educational signage as the example displayed in Figure 4 below.



Figure 4 Outreach materials and educational signage configuration at the Upper Wanapum boat launch, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River ,WA.

2.1.2 Voluntary Boater Surveys

Because of the closure of boat launches on the Wanapum Reservoir during the 2014 recreational season, all voluntary boater surveys were conducted at the PRRA (Desert Aire) boat launch. All voluntary boater surveys were conducted using the 100th Meridian Institute's boater survey form (100th Meridian Initiative 2011c; Appendix C). The surveys were conducted during the Memorial Day holiday weekend, the 4th of July holiday weekend, and on the Labor Day holiday weekend. According to previously conducted vehicle count surveys (Harshman 2011), a majority of the boats launched at Project boat launches occurred between the hours of 0900hrs to 1400hrs, therefore the voluntary boater surveys were generally conducted during this timeframe (~3-6hrs each day). Results from these surveys are presented in Section 3.3 below.

2.2 Monitoring

The monitoring activities implemented as part of the AISP for 2014 included zebra/quagga mussel sampling, benthic surveys, and aquatic plant surveys at each Project boat launch. Descriptions of the monitoring activities applied during 2014 are presented in the following sections.

2.2.1 Zebra/Quagga Mussel

Zebra/quagga mussels were monitored throughout the Project by use of a plankton tow net and deployment of artificial substrates (only in the Priest Rapids Reservoir during 2014 because of the drawdown conditions of Wanapum Reservoir). Zebra/Quagga mussel and other potential AIS species were also surveyed along exposed shorelines and in-river during the drawdown period. Each of these monitoring methods is covered in the following sections.

2.2.1.1 Plankton Tow Net

Horizontal and vertical plankton tow net samples were collected at six locations throughout the Project. Samples were collected at Crescent Bar (RM 440.5), Sunland Estates (RM 426.0), Wanapum forebay (RM 417.0), Crab Creek (RM 412), Lake Geneva (RM 407.0), and Priest Rapids forebay (RM 399.0). Samples were collected three times throughout the monitoring season (once in July, August, and September respectively).

Sample methods included the use of a Wisconsin plankton net (363 μ mesh net) that was drifted for a distance of 40-100 ft. at a depth of approximately 20 ft. for each location. The plankton tow net was thoroughly rinsed and all sample materials were transferred to a 250 ml Teflon bottle and preserved with 70 % isopropyl alcohol. A label was affixed to the sample bottle and appropriately filled out. Methods for collecting vertical tow samples were almost identical to the horizontal tow sampling method as described above, except that samples were taken from one meter above the bottom of the river up through the entire water column without drifting. The sampling procedures followed protocols developed by WDFW (Pamela Meacham, WDFW, pers. com and Jesse Shultz, WDFW, pers. com).

After collection, the samples were cataloged and shipped to Cameron Lange, a Senior Environmental Scientist located in the Great Lakes region of the United States whom is familiar with the identification of zebra/quagga mussel veliger, for analysis. Results and more information of these analyses are presented in Section 3.1.1 and Appendix G.

2.2.1.2 Artificial Substrates

An additional monitoring technique implemented during 2014, and in order to monitor for zebra and quagga mussels near areas with high boat traffic, Grant PUD deployed artificial substrates at some high-traffic Project boat launch areas. Boat launches selected for substrate deployment included only the PRRA (Desert Aire) in the Priest Rapids Reservoir due to the drawdown conditions of Wanapum Reservoir. Grant PUD followed the artificial substrate monitoring protocols as established by the California Department of Fish and Game (CDFG 2008) and provided by the WDFW (Jesse Shultz, WDFW, pers com). A single substrate was deployed at the PRRA boat launch. The substrates were kept at least one meter above the bottom of the river and were examined on the same schedule as the plankton tow net samples. Results from the artificial substrate monitoring are presented in Section 3.1.2.

2.2.1.3 Benthic Fauna Surveys

The unanticipated drawdown of Wanapum Reservoir stranded a number of relatively immobile benthic organisms, including freshwater mussels, snails, fishes, and other organisms. In response, Grant PUD initiated land- and water-based surveys to characterize benthic communities potentially affected by the water-level reduction in the Wanapum Reservoir. This incident provided a unique opportunity to perform surveys in areas previously submerged within the Wanapum Reservoir, to estimate species composition and densities of stranded freshwater mollusks (mussels, clams, and snails) and to search for any potential AIS species of concern. Included in these survey efforts was the potential to find AIS, including zebra/quagga mussels, and NZMS. Results from these surveys are presented in Section 3.1.3.

2.2.2 Aquatic Vegetation Surveys

For the 2014 implementation season, Grant PUD contracted GeoEngineers, Inc. (GeoEngineers) to perform aquatic vegetation boat launch surveys. Aquatic vegetation surveys conducted in 2014 primarily focused on assessing aquatic plant distribution and species composition at four of the ten Project boat launches (all boat launches in the Wanapum Reservoir were not surveyed due to the drawdown conditions of Wanapum Reservoir). Aquatic plant assessment transect locations were initially established in 2011 (the first implementation season) at each Project boat launch (Keeler 2012). For 2014, the Huntzinger boat launch, which was newly constructed, was added to the existing database.

For the 2014 aquatic vegetation surveys, geospatial data layers were compiled into a geodatabase, which included: the Project boundary, aerial imagery, bathymetric data, road information, Project boat launch locations, and survey results from past field efforts, including the transects that were established at each boat launch. This geodatabase was uploaded on to a field computer running geographic information systems (GIS) and mobile Global Positioning System (GPS) and taken in the field to perform the surveys for the 2014 effort. Field surveys were completed on August 12, 2014. Methods used to complete these surveys are discussed below.

2.2.2.1 Boat Launch Transect Survey Methods

The boat launch transect survey methodology generally followed the protocols described in the AISP (Grant PUD 2010). The AISP (Grant PUD 2010) states that boat launch surveys will:

“...be conducted by traveling three 50-meter transects out from the boat launch, or until visual contact with the macrophytes is lost. The first transect will be 30m

upstream of the launch, the second will be even with the middle of the launch, and the third transect will be 30 meters downstream of the launch.”

In practice, transect configurations were adapted to local conditions based on the presence of adjacent shorelines, jetties, and/or other structures.

Boat-based field surveys were conducted using a small field crew consisting of three biologists travelling in a sixteen-foot motorized vessel. A field computer running GIS and mobile GPS software loaded with boat launch transect locations were used to record data along each transect. Aquatic vegetation sampling was conducted either visually or by the use of a sampling rake to depict samples from regularly spaced data points along each transect. At each of the sample locations, a GPS point with associated aquatic plant presence/absence and species composition data were recorded using the mobile GPS device. Rake samples were also examined for presence of potential macroinvertebrate AIS including zebra/quagga mussels and/or NZMS.

During the 2014 surveys, aquatic vegetation presence was recorded at each transect point as follows:

- Dominant species at each point were recorded as Eurasian milfoil, curlyleaf pondweed, native species, or no vegetation.
- Secondary and tertiary co-dominant species, if present, were also recorded (Eurasian milfoil, curlyleaf pondweed, and/or native species).

Results for the 2014 aquatic vegetation surveys are discussed in Section 3.2 and displayed in Figures I-1 through I-4 in Appendix I of this annual report.

2.3 Local and Regional Coordination

Local and regional coordination activities implemented as part of the AISP for 2014 included participation in the Columbia River Basin Team (CRBT) meeting and hosting Grant PUD’s Annual Aquatic Invasive Species meeting. A summary of each activity are presented in the following sections.

2.3.1 Columbia River Basin Team Meeting

Grant PUD attended and participated in the CRBT meeting held in Spokane, Washington on May 13-14, 2014. Meeting minutes are made available at the 100th meridian initiative website at: http://www.100thmeridian.org/Columbia_RBT.asp.

2.3.2 Annual Aquatic Invasive Species Meeting

On April 24, 2014 and in accordance with the AISP, Grant PUD hosted the annual AIS meeting at the Phase II Maintenance Center Building, conference room 123. Per the AISP, the purpose of this meeting is to discuss the upcoming monitoring and educational season, any needed/warranted changes to AIS education, monitoring, and/or control methods or other changes to the AISP based on results from the previous year, new technologies, new AIS threats and/or introductions, new AIS pathways, etc. The meeting generally followed the agenda provided (Appendix J). A PowerPoint was presented by Grant PUD on the results from the 2014 season and the planned efforts for 2015. No modifications were deemed necessary by Grant PUD or the stakeholders for the 2015 implementation season. The next meeting was scheduled for the spring of 2016 after the implementation of the 2015 monitoring and educational season.

3.0 Results

The following sections provide results from the activities conducted as part of the AISP in 2014, which includes outcomes from the zebra/quagga mussel sampling (both plankton tows and artificial substrate), boat launch transect surveys, benthic surveys, and the voluntary boater surveys.

3.1 Zebra/Quagga Mussel Monitoring

As stated above in Section 2.2.1, zebra/quagga mussels were monitored by use of plankton tow nets and artificial substrates throughout the Project. Results from each method are discussed in the following sections.

3.1.1 Plankton Tow Net Results

A total of 18 samples were collected from July – September, cataloged, and sent to Cameron Lange, a Senior Environmental Scientist located in the Great Lakes region of the United States whom is familiar with the identification of zebra/quagga mussel veliger and is recognized as an expert by WDFW (Jesse Shultz, WDFW, pers com), for analysis. The 18 samples were analyzed using standardized techniques that are accepted for zebra mussel analyses. These techniques included the use of a dissecting style microscope fitted with polarizing filters used to examine the samples under 40x-120x magnification. Since zebra mussels have not previously been found at the sample locations within the Project, the entire settled contents of each sample were examined. If samples contained a lot of phytoplankton or plankton, they were prescreened through a 425-micron mesh sieve (Lange 2014).

No zebra mussels were found in any of the samples analyzed. A copy of each analysis was sent via email to WDFW during the 2014 season. Appendix G of this annual report displays all results from samples analyzed during 2014.

3.1.2 Artificial Substrate Results

During the same timeframe as the plankton tow samples were collected (July - September), artificial substrates were checked for presence/absence of zebra/quagga mussels or other AIS macroinvertebrate. A standardize form were supplied by WDFW to check for presence/absence of mussels (WDFW 2010; Appendix H). No presences of zebra/quagga mussels on any other macroinvertebrate AIS during the 2014 season were detected. Results were cataloged and sent via email to WDFW.

3.2 Benthic Fauna Survey Results

Twelve taxa of snails and seven species of bivalve, including three native freshwater mussels and one non-native clam were found in the Wanapum Reservoir during the survey period. No zebra/quagga mussels or NZMS were encountered during these survey efforts.

3.3 Aquatic Plant Survey Results

Results from the survey efforts put forth for mapping and tracking aquatic vegetation along three transects at each Project boat launch are depicted in the following sections. Survey efforts during 2014 concentrated primarily on the boat launch transects that were recorded during previous survey efforts (Keeler 2012-2014).

3.3.1 Boat-Launch Transects

Figures I-1 through I-4 in Appendix I of this report illustrate results of aquatic vegetation mapping along three transects established at each Project boat launch, while Table 1 includes a summary of results for each boat launch (including past survey results), plus notes regarding presence of aquatic AIS and/or native species.

Table 1 Summary of Results for Boat Launch Transect Monitoring 2011-2014, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

Year	Crescent Bar			Sunland Estates			Frenchman Coulee			Kittitas County			State Park			Upper Wanapum			Lower Wanapum			Huntzinger			Buckshot			PRRA		
	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS	EM	CP	NS
2011	X	X		X			X	X		X	X		X	X		X	X								X			X		
2012	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X
2013	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X							X	X	X	X	X	X
2014																						X	X	X	X		X	X	X	

Notes:

1. EM = Eurasian milfoil; CP = curlyleaf pondweed; NS = native species.
2. Native species were not recorded in 2011.
3. The following boat launches were not surveyed in 2014 due to drawdown: Crescent Bar, Sunland Estates, Frenchman Coulee, Kittitas County, State Park and Upper Wanapum
4. Huntzinger boat launch was formally established between the 2013 and 2014 survey seasons and was therefore not sampled prior to 2014.

Each GPS point location along these transects represent a single sampling point where presence or absence of AIS or native species was recorded. Sampling focused primarily on AIS, but native species distribution and presence were additionally recorded at these locations. In some cases, transects were terminated early as a result of loss of contact with aquatic vegetation, which was often correlated with a water depth greater than twenty feet and therefore beyond the littoral zone where aquatic vegetation could survive. This is consistent with the protocol for these surveys outlined in the AISP (Grant PUD 2010).

Eurasian milfoil was present at all but one of the boat launches surveyed in 2014. Lower Wanapum did not have any submergent vegetation, which is consistent with previous survey results. However, Eurasian milfoil was rarely dominant (at only one transect point at the Huntzinger boat launch) and boat launches were generally dominated by native species. Curlyleaf pondweed was present at two of the four boat launches (Huntzinger and PRRA) and was never dominant. Native species observed at boat launch transects typically included the following species, which were not recorded on a point-specific basis: coontail (*Ceratophyllum demersum*), common waterweeds (*Elodea* spp.), and native pondweed species (*Potamogeton* spp.). Transect results from 2014 are generally consistent with data gathered in 2013. Eurasian milfoil had a similar distribution as in 2013, with presence at the same launches (of those surveyed in 2014) and rarely exhibiting dominance. Curlyleaf pondweed was observed somewhat less in 2014 than this species had been in previous years. For example, it was not observed at the Buckshot boat launch in 2014, as it had been in previous years and, though present at PRRA, it did not exhibit dominance in 2014 as it had in prior years. As with prior years, native species remain dominant at most transect points at most boat launches. In 2014, native species were dominant at all transect points that had vegetation except one, which occurred at Huntzinger and was dominated by Eurasian milfoil.

Differences in data results between sampling years are likely the result of a couple of different circumstances. These circumstances include differences in timing of survey efforts and annual variation in phenology of submergent vegetation. In 2014, the fourth year of data collection at boat launches since implementation of the AISP, surveys were intentionally scheduled within one week of the dates that 2013 surveys were completed (August 12, 2014, versus August 5, 2013) to reduce potential differences due to survey timing. Data results from 2014 and 2013 are very similar, more so than they have been in years prior (boat launch transect surveys were completed in October in 2011 and September in 2012). Nevertheless, some differences between years were observed. For example, at the PRRA boat launch, curlyleaf pondweed was less prevalent, which could be the result of the aquatic vegetation community at the PRRA boat launch still maturing since the boat launch was reconfigured and dredged in 2012, and vegetation has only had the opportunity to establish and mature for two seasons. However, there is no explanation or record of any changes/modifications to the boat launch at Buckshot that would explain the absence of curlyleaf pondweed there in 2014.

3.4 Boater Survey/Self-Survey Results

As stated in Section 2.2.1, voluntary boater surveys were all conducted at the PRRA boat launch on key recreational weekends (Memorial Day, 4th of July, and Labor Day) during 2014 because of the drawdown of Wanapum Reservoir. Self-survey forms were available at most boat launches during the recreational season.

A total of forty-nine boaters (forty-seven voluntary surveys and two self-surveys) were interviewed/surveyed during the voluntary/self-survey periods. Of the boaters interviewed/surveyed during the recreation season, all claimed the state of Washington as their home state. Cities of residence are noted in Table 2 from the boater surveys. The results were and even split for the 2014 survey season, with each side of the state being represented twenty-three times.

Table 2 Cities of Residence Noted from the Boater Survey conducted at the PRRA Boat Launch during major weekends, 2014, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

Cities of Residence	No. of Occurrences
Mattawa/Desert Aire	7
Yakima	4
East Wenatchee	3
Kirkland, Renton, Auburn, Seattle, Monroe, Ellensburg, Royal City	2
Gig Harbor, Bellevue, Carnation, Enumclaw, Lynnwood, Kent, Woodinville, Sammamish, Bellingham, Marysville, Snohomish, Bremerton, Bonney Lake, Ephrata, Warden, Moxee, Selah and Pasco	1

Several other water bodies were noted as having “been there” or “going there” when asked during the interview or noted on the self-survey form. The waterbodies noted are included in Table 3 below including the number of occurrence of the waterbody.

Table 3 Waterbodies noted as having “been there” or “going there” from boater surveys, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

Waterbody	No. of Occurrences
Lake Roosevelt	5
Lake Washington, Columbia River	4
Moses Lake, Potholes Reservoir, Banks Lake	3
Klickitat River, Puget Sound, Snake River	2
Lake Sammamish, American Lake, Crawfish Lake, Duck Lake, Lake Chelan, Lake Union, Rimrock Reservoir, Billy Clap Lake, Wind River, Duwamish Slough	1

4.0 Summary

In 2014, and in accordance with the AISP (Grant PUD 2010), Grant PUD conducted activities that included education, monitoring, and local and regional coordination.

Educational activities for 2014 included placement of outreach materials and signage at four Project boat launches, placement of outreach material at major recreational outlet stores, a poster presentation and outreach material distributed at Grant PUD's Archaeology Days, and conducting voluntary boater surveys at the PRRA boat launch during high use periods.

Boater surveys/self-surveys were conducted on a total of forty-nine boats. Cities of residence were varied throughout and included Mattawa/Desert Aire (seven instances), Yakima (four instances), Kirkland, Renton, Auburn, Seattle, Monroe, Ellensburg, and Royal City (two instances each), with all other cities as single occurrences. Waterbodies noted as having "been there" or "going there" during survey efforts included Lake Roosevelt (five times), Lake Washington and the Columbia River (six times), Moses Lake, Potholes Reservoir and Banks Lake (three times), Klickitat River, Puget Sound and the Snake River (two times), with all other waterbodies noted once. No interviewees were noted as having AIS present on their vessel and/or trailer.

Monitoring activities during 2014 consisted of zebra/quagga mussel sampling/surveying, benthic surveys, and invasive aquatic plant surveys along with passive-monitoring of riparian/wetland invasive plants conducted at Project boat launches.

Results from the monitoring efforts in 2014 reported no zebra/quagga mussel veliger identified in any samples and no presence of zebra/quagga mussels or other macroinvertebrate AIS including NZMS on any artificial substrates within the Project. Additionally, during the benthic fauna surveys performed within Wanapum Reservoir, no zebra/quagga mussels or NZMS were encountered during these survey efforts. Eurasian milfoil was present at all but one of the boat launches surveyed in 2014. Lower Wanapum did not have any submergent vegetation, which is consistent with previous survey results. However, Eurasian milfoil was rarely dominant (at only one transect point at the Huntzinger boat launch) and boat launches were generally dominated by native species. Curlyleaf pondweed was present at two of the four boat launches (Huntzinger and PRRA) and was never dominant. Native species observed at boat launch transects typically included the following species, which were not recorded on a point-specific basis: coontail (*Ceratophyllum demersum*), common waterweeds (*Elodea* spp.), and native pondweed species (*Potamogeton* spp.). Transect results from 2014 are generally consistent with data gathered in 2013. Eurasian milfoil had a similar distribution as in 2013, with presence at the same launches (of those surveyed in 2014) and rarely exhibiting dominance. Curlyleaf pondweed was observed somewhat less in 2014 than this species had been in previous years. For example, it was not observed at the Buckshot boat launch in 2014, as it had been in previous years and, though present at PRRA, it did not exhibit dominance in 2014 as it had in prior years. As with prior years, native species remain dominant at most transect points at most boat launches. In 2014, native species were dominant at all transect points that had vegetation except one, which occurred at Huntzinger and was dominated by Eurasian milfoil.

Local and regional coordination activities in 2014 consisted of participation in the CRBT meeting and hosting Grant PUD's Annual Aquatic Invasive Species meeting.

The annual AIS meeting was held on April 23, 2015. The meeting generally followed the agenda provided (Appendix J). A PowerPoint was presented by Grant PUD on the results from the 2014 season and the planned efforts for 2015. No modifications were deemed necessary by Grant PUD or the stakeholders for the 2015 implementation season. The next meeting was scheduled for the spring of 2016 after the implementation of the 2015 monitoring and educational season.

Grant PUD will continue implementation in 2015 in accordance with the AISP that was approved by FERC on July 7, 2010.

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Appendix A
100th Meridian Institute's *Zap the Zebra* Brochure



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.

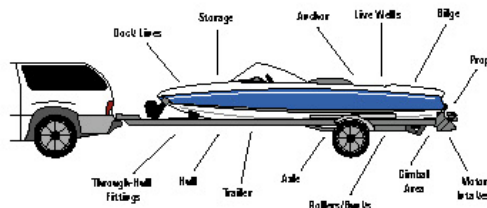
✓ Dry

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



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.

100th Meridian Initiative



Please report any sighting by calling our National Hotline:

1-877-STOP-ANS

1-877-786-7267



100th Meridian Initiative

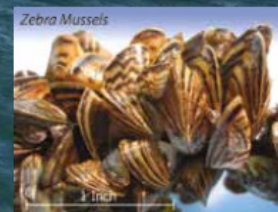
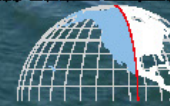


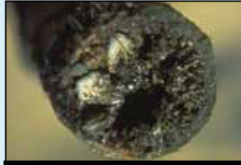
Image Credits: Zebra Mussels on a Fishing Lure by Marc Murrell, Kansas Department of Wildlife and Parks • Zebra Mussels, Zebra Mussels on a Bear Can, Zebra Mussels on a Native Mussel, Bear Bucket, Quagga Mussels, Zebra/Quagga Mussel Distribution, January 2009 by David Britton, U.S. Fish & Wildlife Service • Zebra Mussels in a Car-Away Pipe by Don Schlosser, Great Lakes Science Center • Zebra Mussels in a Pipe by Craig Cza medzi, Michigan Sea Grant • Quagga Mussels Encrusting a Boat Motor by Matt Watson, The University of Texas at Arlington • The distribution map is 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!

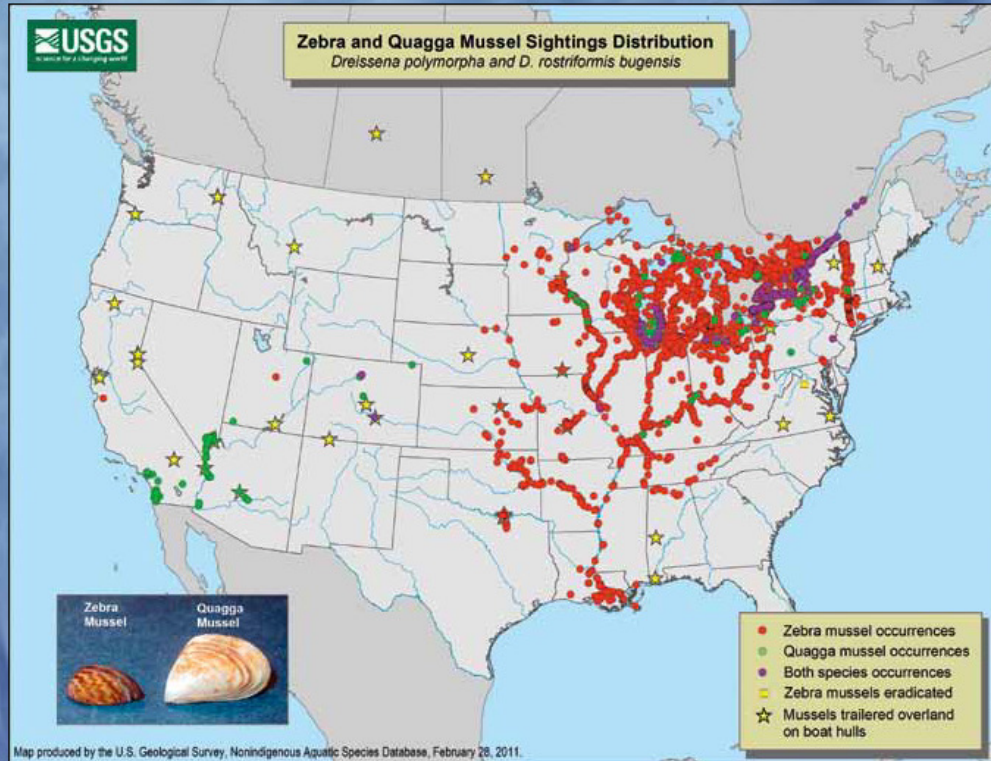
Once a boat has been in infested waters, it could carry invasive mussels. These mussels can spread to new habitats on boats trailered by commercial haulers or the public. Zebra and quagga mussels attach to boats and aquatic plants carried by boats. These mussels also commonly attach to bait buckets and 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



Map produced by the U.S. Geological Survey, Nonindigenous Aquatic Species Database, February 28, 2011.

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 beer 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?

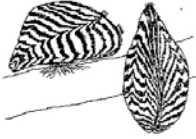
Larvae are microscopic and adults may be up to two inches long. They are usually found in clusters.

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.

Appendix B
100th Meridian Institute's Boater Self-Survey Form

LOCATION _____ STATE _____ DATE _____



**100TH MERIDIAN INITIATIVE TO PREVENT THE WESTWARD EXPANSION OF ZEBRA MUSSELS
BOATER SELF-SURVEY**

The Zebra Mussel

The 100th Meridian Initiative is a multi-agency partnership effort to prevent the westward spread of zebra mussels and other aquatic nuisance species to western North American waters. The U.S. Fish & Wildlife Service is sponsoring and coordinating education outreach and voluntary trailered boat surveys with other agencies in the states on the 100th meridian. Surveys similar to this are being conducted in Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota and the Canadian Province of Manitoba. This survey is now being extended to the Colorado River. You as a boater are being asked to voluntarily inspect your trailer, boat and related equipment for any transported aquatic species, such as the **zebra mussel**, which may be carried accidentally to new locations. Your assistance and participation is appreciated in completing this survey and returning it in the provided, stamped envelope to the agency that is conducting this survey for the U.S. Fish and Wildlife Service. Please review the enclosed information on introduced aquatic species and boat and trailer inspections. Be sure to clean your boat, trailer and equipment after hauling-out the boat and before leaving the ramp area. Thanks for your help!

The following instructions will help you complete the survey.

Part One – Where are you from? (Any information provided is voluntary and anonymous.)

Please state the purpose of your visit, and fill in the boxes relating to your boat and home state. Your most recent launches are very important information, so please be as complete as possible.

Part Two – Where are you going?

Please indicate where you will be launching next **after you leave this lake**. Do not list further launchings at this lake. Again, please be as complete as possible in filling out this section.

Part Three – Returning the survey.

That's all there is to it! All you need to do is place this page in the provided, stamped, return envelope, seal it, and drop it in the mail.

SURVEY INFORMATION (Please Print)

PART ONE: Where are you from?		Home State:	Zip Code:
Type of Boat:	<input type="checkbox"/> Angling	<input type="checkbox"/> Pleasure	<input type="checkbox"/> Jet Ski
	<input type="checkbox"/> Canoe	<input type="checkbox"/> Other	explain
How many times have you launched in the last year?			
Do you always launch in the same water body? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If no, please list below where else you have launched recently.			
Water Body:	State:	County:	Date:
1.			
2.			
3.			
PART TWO: Where are you going? Please list below where you plan to launch next.			
Water Body:	State:	County:	Date:
1.			
2.			
Are you already aware of threats of zebra mussels? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Or any other aquatic nuisance species? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Do you clean your boat and trailer between launchings? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is your boat kept on land or in water when not in use? <input type="checkbox"/> On Land <input type="checkbox"/> In Water			
If in water, where is it kept? Water body:		State:	
Any Comments:			

Appendix C
100th Meridian Institute's Boater Survey Form



**STOP AQUATIC
HITCHHIKERS!**

100th Meridian Initiative

Interview/Inspection Form for Trailered Boats
and Aquatic Invasive Species

100th Meridian Initiative



Site Information

Interviewer:	Date:	Time:
Water Body:	State:	Survey Type: <input type="radio"/> Contact <input type="radio"/> Observation
Specific Location:		

Boater Information

Home State:	Zip:	Boat Type: <input type="radio"/> Angling <input type="radio"/> Pleasure <input type="radio"/> Pontoon <input type="radio"/> Jetski/PWC <input type="radio"/> Canoe/Kayak <input type="radio"/> Houseboat <input type="radio"/> Other Boat/Trailer Condition: <input type="radio"/> Clean & Dry <input type="radio"/> Dirty or Wet
Was the boat commercially hauled?	<input type="radio"/> Yes <input type="radio"/> No	
Do you always launch in the same water body?	<input type="radio"/> Yes <input type="radio"/> No	
How many times have you launched this year?		
How often do you clean your boat? <input type="radio"/> After every launch <input type="radio"/> After a few launches <input type="radio"/> Occasionally <input type="radio"/> Never	Boat cleaning method: <input type="radio"/> Car wash/High pressure <input type="radio"/> Home/Hand Wash <input type="radio"/> Professional Cleaning <input type="radio"/> Not Applicable	
Do you keep your boat moored or in a slip?	<input type="radio"/> Yes <input type="radio"/> No	
If so, where?		
Boat direction (coming or going):		

Knowledge/Action Information

Have you heard of zebra/quagga mussels?	<input type="radio"/> Yes <input type="radio"/> No	How?
Have zebra/quagga mussels impacted you?	<input type="radio"/> Yes <input type="radio"/> No	How?
Have you heard of other aquatic invasives?	<input type="radio"/> Yes <input type="radio"/> No	How?
Have any AIS affected you?	<input type="radio"/> Yes <input type="radio"/> No	How?
Did you inspect your boat for AIS today?	<input type="radio"/> Yes <input type="radio"/> No	How?
Would you wash your boat if a public washing facility was available nearby?	<input type="radio"/> Yes <input type="radio"/> No	
Has anyone asked you about zebra/quagga mussels before?	<input type="radio"/> Yes <input type="radio"/> No	
If so, who?	If so, when?	
Have you ever considered changing destinations to avoid AIS issues?	<input type="radio"/> Yes <input type="radio"/> No	

Destination Information

Where else do you take the boat that you are using today?			
Water Body:	State:	<input type="radio"/> Been There	<input type="radio"/> Going There
Water Body:	State:	<input type="radio"/> Been There	<input type="radio"/> Going There
Water Body:	State:	<input type="radio"/> Been There	<input type="radio"/> Going There
Water Body:	State:	<input type="radio"/> Been There	<input type="radio"/> Going There

Boat Inspection

AIS Found? <input type="radio"/> Yes <input type="radio"/> No	If yes, what species?
	If yes, where was it found?

Comments

--

Please send copies of all completed forms to: David Britton, UT Arlington - Biology, UTA Box 19498, Arlington, TX 76019

Appendix D
The Washington Department of Fish and Wildlife's Aquatic Invasive Species Poster
displayed at Project Boat Launches

STOP



Milfoil

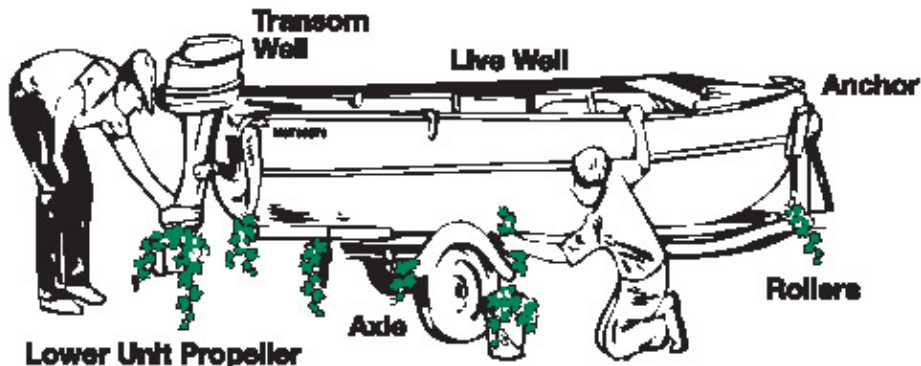


Zebra Mussel

It is **ILLEGAL** to transport or spread
Aquatic Invasive Species!

Before Launching & Before Leaving

You Must Remove **ALL**
Plants & Animals from Watercraft, Trailer and Gear.
You Must Drain **ALL**
Water from Fish/Live Wells, Holds and Bilges.



Unlawful to Transport Aquatic Plants - R.C.W. 77.15.290
Unlawful Use of Prohibited Aquatic Animal Species - R.C.W. 77.15.253
Unlawful Release of Fish, Shellfish or Wildlife - R.C.W. 77.16.260

To obtain information on free boat inspections, Report a sighting or
Find out more about Aquatic Invasive Species:
Call **1-888-WDFW-AIS (933-9247)** or go to **www.WDFW.WA.GOV**



STOP AQUATIC HITCHHIKERS!
Prevent the spread of aquatic invasive species.
www.wdfw.wa.gov

Appendix E
The Washington Department of Ecology's Eurasian Water Milfoil Advisory Poster
displayed at Project Boat Launches

ALERT!!

These waters contain



Under Washington law
transport or distribution of these species is

PROHIBITED

***PLEASE! Clean your boat
and trailer before leaving the area:***

- Remove **ALL** aquatic plants and animals
- Drain **ALL** water
- **NEVER** empty aquariums or bait.



***Boats and trailers carrying
these species are subject
to criminal and civil penalties.***



Appendix F
**AIS Poster titled “*Aquatic Invasive Species in the Priest Rapids Project*” presented at Grant
PUD’s Archaeology Days, October 14-15, 2014**

Aquatic Invasive Species in the Priest Rapids Project

What are Aquatic Invasive Species?

Any nonnative animal or plant species that live in, on, or next to water that are likely to cause harm to the economy, environment or human health. Invasive species are highly competitive, highly adaptive, and successful at reproducing in large numbers.

What is Grant PUD's role in helping stop the spread of Aquatic Invasive Species?

The Aquatic Invasive Species Control and Prevention Plan (AISP) includes educational, monitoring, and rapid response components intended to help reduce the potential for new AIS to be introduced into and become established within the Priest Rapids Project.

What is your role in helping the spread of Aquatic Invasive Species?

Follow these steps to reduce the spread of aquatic invasive species when taking your watercraft from the water:

- Remove any visible plants, mud, fish or animals
- Eliminate water from equipment & boat hull
- Clean and dry anything that came in contact with water
- Never release plants, fish or animals into a body of water unless they came out of that body of water

Websites for more information on AIS

Grant PUD's AIS: <http://www.gcpud.org/naturalResources/fishWater/Wildlife/aquaticInvasiveSpecies.html>

Washington Invasive Species Education: <http://www.wise.wa.gov/>

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

Protect Your Waters: <http://www.protectyourwaters.net/>

WDFW Aquatic Invasive Species: <http://wdfw.wa.gov/ais/>

Examples of Aquatic Invasive Species



Zebra Mussels



Quagga Mussels



New Zealand Mud Snail



Eurasian Watermilfoil

Examples of Aquatic Invasive Species Signage



Appendix G
Zebra/Quagga Mussel veliger sample results during 2014, Priest Rapids Hydroelectric
Project, mid-Columbia River, WA

Date	Reservoir	Location ¹	Collection Method	Zebra Mussels	<i>Corbicula</i>	Prescreened	Comments
7/7/14	Wanapum	WF	Vertical/Horizontal	No	No	No	Heavy Phytoplankton
7/7/14	Priest Rapids	CC	Vertical/Horizontal	No	Few	No	Heavy Phytoplankton
7/7/14	Wanapum	SE	Vertical/Horizontal	No	No	No	Heavy Phytoplankton
7/7/14	Priest Rapids	LG	Vertical/Horizontal	No	No	No	Heavy Phytoplankton
7/7/14	Wanapum	CB	Vertical/Horizontal	No	Some	No	
7/7/14	Priest Rapids	PRF	Vertical/Horizontal	No	Many	No	
8/26/14	Wanapum	WF	Vertical/Horizontal	No	No	No	
8/26/14	Priest Rapids	CC	Vertical/Horizontal	No	Many	No	Heavy Phytoplankton
8/26/14	Wanapum	SE	Vertical/Horizontal	No	No	No	
8/26/14	Priest Rapids	LG	Vertical/Horizontal	No	Few	No	
8/26/14	Wanapum	CB	Vertical/Horizontal	No	No	No	
8/26/14	Priest Rapids	PRF	Vertical/Horizontal	No	No	No	Heavy Phytoplankton
9/30/14	Wanapum	WF	Vertical/Horizontal	No	No	No	
9/30/14	Priest Rapids	CC	Vertical/Horizontal	No	Some	No	Some Ostracodes
9/30/14	Wanapum	SE	Vertical/Horizontal	No	Many	No	
9/30/14	Priest Rapids	LG	Vertical/Horizontal	No	No	No	
9/30/14	Wanapum	CB	Vertical/Horizontal	No	Many	No	
9/30/14	Priest Rapids	PRF	Vertical/Horizontal	No	No	No	
¹ CB=Crescent Bar, SE=Sunland Estates, WF=Wanapum Forebay, CC=Crab Creek, LG=Lake Geneva, PRF=Priest Rapids Forebay							

Appendix H
Zebra/Quagga Mussel Artificial Substrate Datasheets

WDFW Artificial Substrate Monitoring
(One datasheet for each artificial substrate)

Collection Information

Date (M/D/Y): _____ Site #: _____ Sampler (s): _____
 Water Body: _____ Reservoir: _____ Site Description: _____
 Site Location: _____ Substrate Attached To: _____
 GPS (WGS 84, Decimal Degrees 00.000) _N _____ W _____
 Substrate Depth (m): _____ Total Water Depth (m): _____ Secchi Depth (m): _____
 Salinity: _____ pH: _____ Temperature @: _____ D.O.: _____ Calcium: _____

Substrate

Substrate :	Present	Absent		Redeployed
Condition :	Intact	Damaged	Out of Water	Yes No

Mussels

Mussels:	Present	Absent	Species :	Quagga	Zebra	Unknown
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Where (circle all that apply):

Plate surface _____
 Plate edge _____
 Weight _____
 Spacers _____
 Rope (depth) _____
 Other _____

Total # of mussels on each part of substrate:

Plates:	Number of mussels	Density (# of mussels / 36)
Plate 1 T (top side of top plate)	_____	_____
Plate 1 B (bottom side of top plate)	_____	_____
Plate 2 T (top side of 2 nd plate)	_____	_____
Plate 2 B (bottom side of 2 nd plate)	_____	_____
Plate 3 T (top side of 3 rd plate)	_____	_____
Plate 3 B (bottom side of 3 rd plate)	_____	_____
Plate 4 T (top side of last plate)	_____	_____
Plate 4 B (bottom side of last plate)	_____	_____

Other Organisms Present: _____

Comments:

Appendix I
Boat Launch Transect Maps for 2014

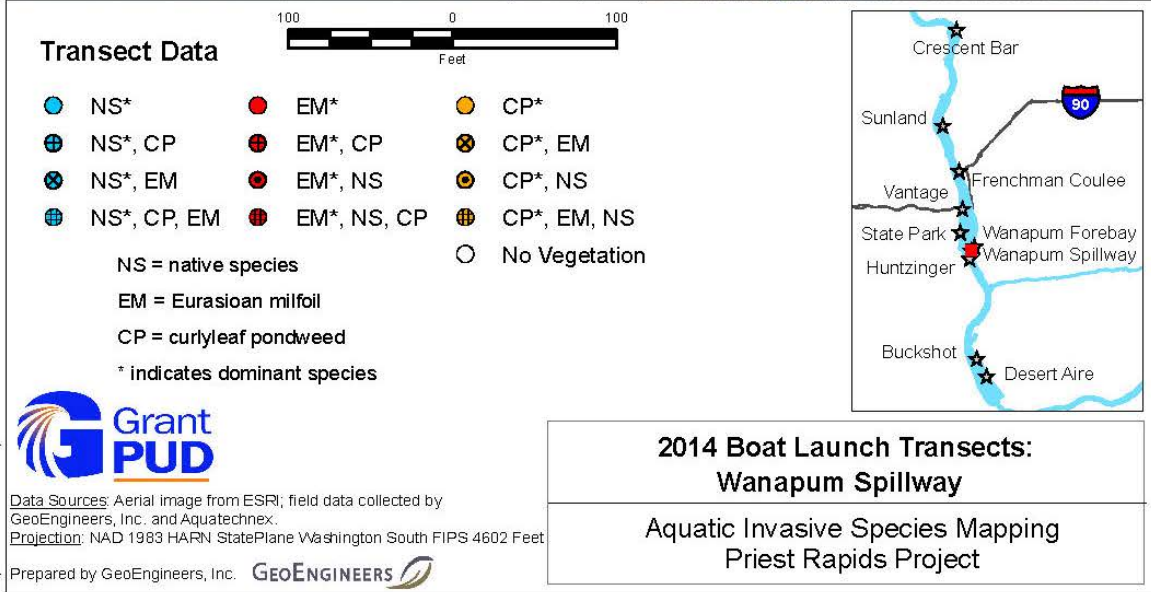


Figure I-1 Wanapum Tailrace Boat Launch Transects, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

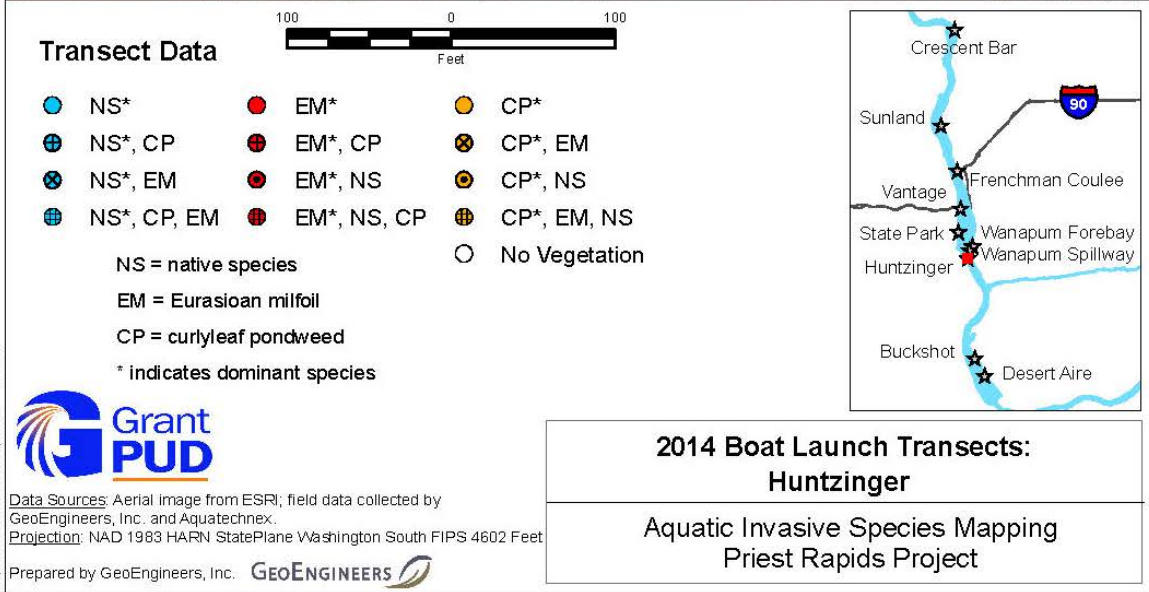
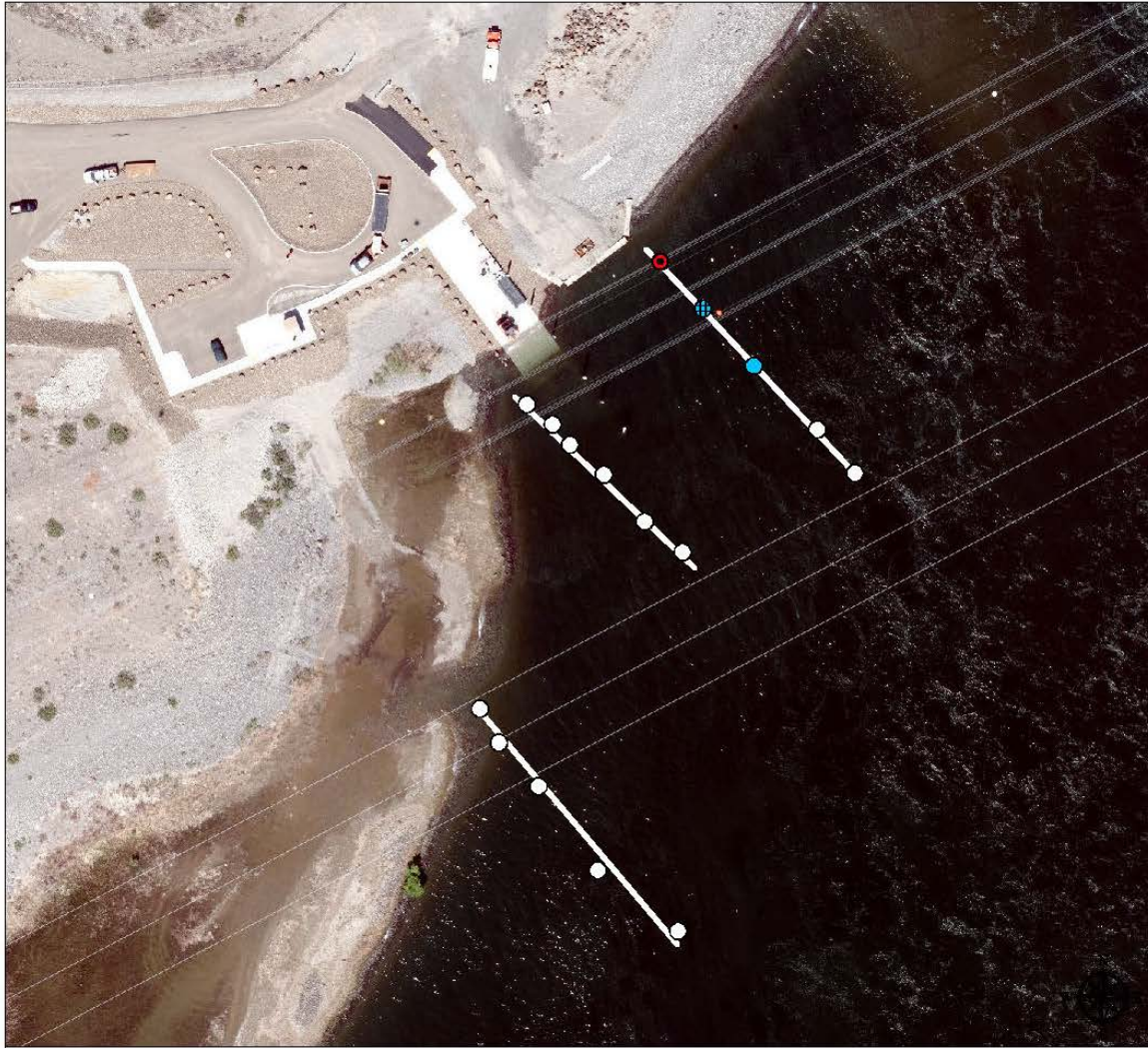


Figure I-2 Huntzinger Boat Launch Transects Map, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

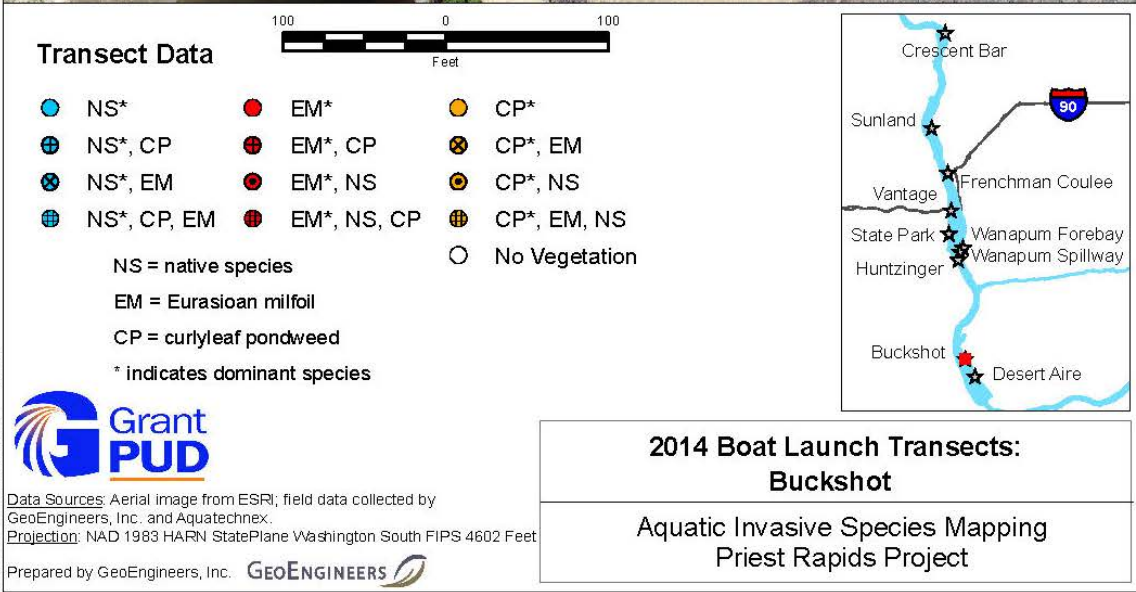


Figure I-3 Buckshot Boat Launch Transects Map, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

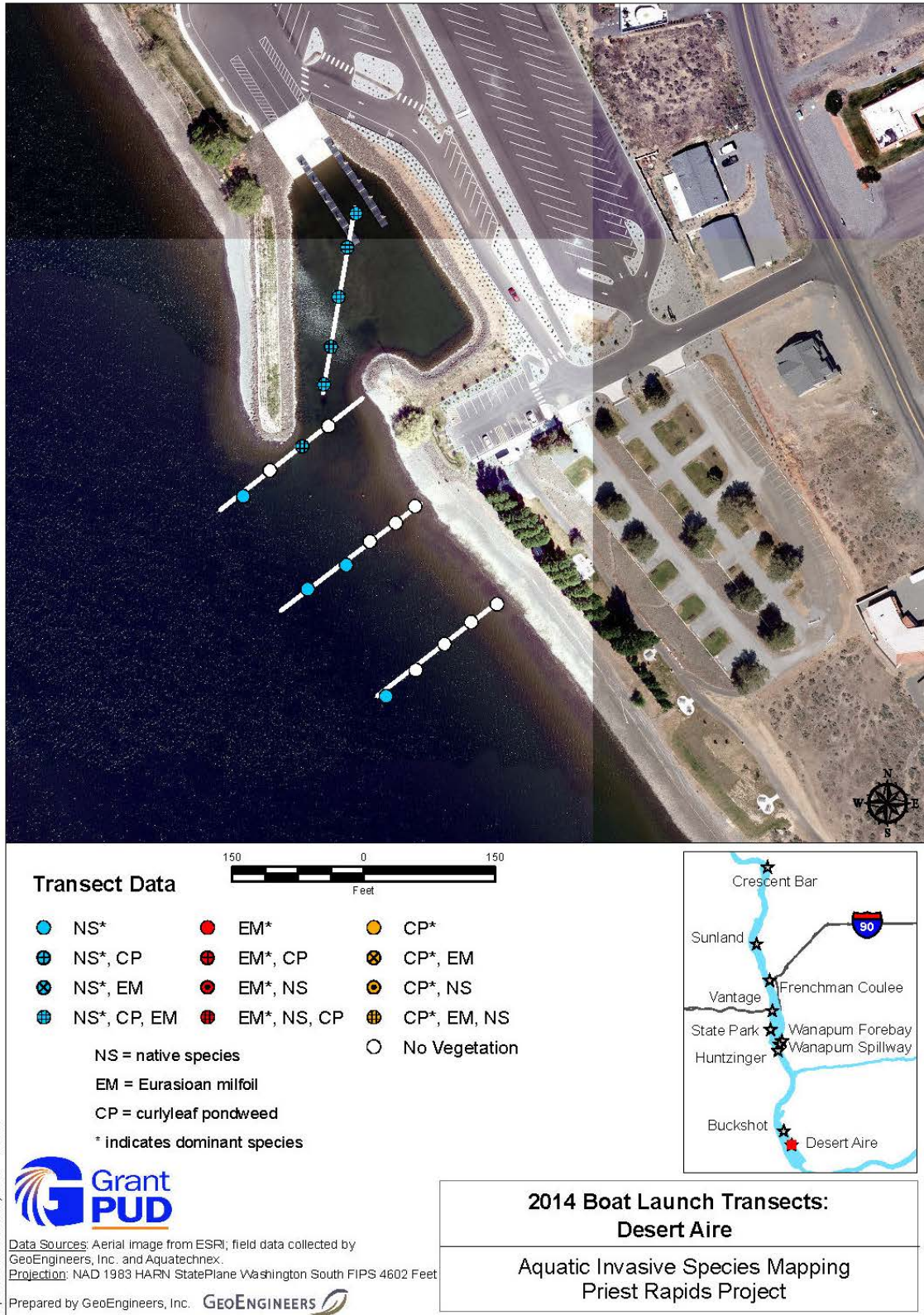


Figure I-4 Priest Rapids Recreation Area (PRRA)/Desert Aire Boat Launch Transects Map, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

Appendix J
Annual Aquatic Invasive Species Meeting Agenda, April 2015



Annual Aquatic Invasive Species Meeting

Where: Wanapum Maintenance Center Phase II Building, Conference Room
123
(14353 Highway 243 South, Beverly, WA)

When: Thursday, April 23 2015
10:00 a.m. – 12:00 p.m.

AGENDA

- I. Welcome and Introductions
- II. Review of activities addressed in the Aquatic Invasive Species Control and Prevention Plan: 2014 Annual Report
 - A. Education
 1. Outreach Material and Educational Signage
 2. Voluntary Boater Surveys
 - B. Monitoring
 1. Zebra/Quagga Mussel
 - a) Plankton Tow Net
 - b) Artificial Substrates
 - c) Aquatic Vegetation Surveys
 - C. Local and Regional Coordination
 1. Columbia River Basin Team Meeting
 2. Annual AIS Meeting
- III. Results for 2014 Implementation Season

- A. Zebra/Quagga Mussel Monitoring
 - 1. Plankton Tow Net
 - 2. Artificial Substrate
 - B. Aquatic Plant Surveys
 - 1. Shoreline Surveys
 - 2. Boat Launch Transects
 - C. Boat Survey/Self-Surveys
- IV. Review of 2015 Activities
- A. Continued Zebra/Quagga Mussel sampling
 - 1. Plankton tows
 - 2. Artificial substrate monitoring
 - B. Boat Launch Voluntary boat inspections
 - 1. (4) per year: Memorial Day weekend, one weekend in June, 4th of July weekend, and Labor Day weekend.
 - 2. At one "major" boat launch (i.e. Crescent Bar, Sunlands, Vantage (Kittitas County), and Desert Aire (Priest Rapids Recreation Area).
 - C. Boat Launch Self-surveys
 - 1. Voluntary form to be displayed at nine boat launches
 - 2. Forms collected periodically and cataloged
 - D. Educational Materials
 - 1. Material(s) obtained from WDFW, WDOE, USFWS, etc.
 - 2. Consisting of information for milfoil, Zebra/Quagga Mussels, NZMS
 - 3. Provide at key recreational business locations within Grant County and surrounding areas during peak boating season (May 1 – Oct. 30)
 - 4. Provide at major boat launches throughout Project
 - E. Aquatic Vegetation Surveys
 - 1. Shoreline monitoring/mapping
 - 2. Project boat launches
 - 3. NZMS and/or other AIS will be monitored during these surveys
- V. Review of AIS List/Additional Recommendations for the 2015 Implementation Season, etc.
- VI. Open Discussion

Appendix K
WDOE/WDFW comments received from the AISP 2014 Annual Report



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

March 12, 2015

Mr. Tom Dresser
Fish, Wildlife and Water Quality Manager
Grant County PUD
PO Box 878
Ephrata, WA 98823

RE: Request for Ecology Review – *Aquatic Invasive Species Control and Prevention Plan, 2014 Annual Report*. Priest Rapids Hydroelectric Project, FERC No. 2114

Dear Mr. Dresser:

The Department of Ecology (Ecology) has reviewed the *Aquatic Invasive Species Control and Prevention Plan, 2014 Annual Report* sent via email to Ecology on February 26, 2015. The Report is a requirement of FERC license article 401(a)(22) and section 6.6(4)(g) of the Ecology Water Quality Certification.

Ecology has reviewed the 2013 Annual Report and has no comments.

Please contact me at (509) 329-3567 or pmcg461@ecy.wa.gov if you have any questions.

Sincerely,

Patrick McGuire
Eastern Region FERC License Coordinator
Water Quality Program

PDM:jab

cc: Carson Keeler, Grant County PUD



From: [Verhey, Patrick M \(DFW\)](#)
To: [Carson Keeler](#)
Cc: [Debbie Firestone](#); [Schultz, Jesse M \(DFW\)](#)
Subject: RE: Grant County PUD Draft Aquatic Invasive Species Control & Prevention Plan Annual Report
Date: Monday, March 16, 2015 2:23:19 PM
Attachments: [WDFW comments 2015 02 26 2014 GCPUD AISP Consultation Draft \(2\).pdf](#)

Carson, Jesse and I had a few comments on Grant County PUD's draft 2014 Aquatic Invasive Species Control and Prevention Plan annual report for the Priest Rapids Project. Our comments are inserted into the attached document.

Overall the Report is very good!



Patrick Verhey

Renewable Energy Biologist
WDFW Habitat Program
Renewable Energy Section
1550 Alder St N.W.
Ephrata, WA 98823
(509) 754-4624 ex. 213
Patrick.Verhey@dfw.wa.gov
Work schedule is M-Th

From: Debbie Firestone [<mailto:Dfirest@gcpud.org>]
Sent: Thursday, February 26, 2015 7:56 AM
To: Verhey, Patrick M (DFW); McGuire, Patrick D. (ECY); Bellatty, James (ECY); Aaron Jackson (AaronJackson@ctuir.org); Bob Rose (brose@yakama.com); Brian McIlbraith (MCIB@critfc.org); CarlMerkle@ctuir.com; Debbie Williams; Doris Squeochs; Gary James (GaryJames@ctuir.org); Jason McLellan (Jason.McLellan@colvilletribes.com); Korth, Jeff (DFW); keith.hatch@bia.com; Mike Clement; Verhey, Patrick M (DFW); Rex Buck, Jr.; Steve Lewis (Stephen_Lewis@fws.gov); Tom Dresser; Tracy Hillman (Tracy.hillman@bioanalysts.net)
Cc: Tom Dresser; Ross Hendrick; Carson Keeler; John Monahan
Subject: Grant County PUD Draft Aquatic Invasive Species Control & Prevention Plan Annual Report

Good morning,

Attached please find for your review Grant County PUD's draft 2014 Aquatic Invasive Species Control and Prevention Plan annual report for the Priest Rapids Project consistent with the requirements of the Priest Rapids Hydroelectric FERC license and Washington Department of Ecology's 401 Water Certification.

Grant County PUD appreciates receiving your comments not later than March 30, 2015. Should you have questions, please contact Carson Keeler at 509-754-5088 Ext. 2687 or by email at Ckeeler@gcpud.org.

Appendix L
Summary Table, Grant PUD responses to WDOE/WDFW comments from the AISP 2014
Annual Report

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
Washington State Department of Ecology (WDOE)	03/12/15 (Letter from Patrick McGuire)	1	The Department of Ecology (Ecology) has reviewed the <i>Aquatic Invasive Species Control and Prevention Plan, 2014 Annual Report</i> sent via email to Ecology on February 26, 2015. The Report is a requirement of the FERC license article 401(a)(22) and Section 6.6(4)(g) of the Ecology Water Quality Certification.	Grant PUD appreciates Ecology's review and coordination on the development of the Aquatic Invasive Species Control and Prevention Plan (AISP) in accordance with Section 6.6.4 of the 401 Water Quality Certificate and Article 401(a)(22) of the FERC license to operate the Priest Rapids Project.
		2	Ecology has reviewed the 2014 Annual Report and has no comments.	Grant PUD appreciates the comments and review of the AISP 2014 Annual Report.
Washington Department of Fish and Wildlife (WDFW)	03/16/15 (email from Patrick Verhey)	1	...Jesse and I had a few comments on Grant County PUD's draft 2014 Aquatic Invasive Species Control and Prevention Plan annual report for the Priest Rapids Project. Our comments are inserted into the attached document.	Grant PUD appreciates WDFW's support in the continued development and review of the AISP for the Priest Rapids Project and its continued participation in the annual meeting and annual report review. Grant PUD also appreciates WDFW's support throughout the entire implementation season during 2014. Grant PUD looks forward to continuing its open relationship with WDFW regarding the implementation of the AISP for the Priest Rapids Project. With our continued combined efforts may we continue to thwart the introduction of unwanted AIS species into the Project.
		2	Overall the Report is very good!	Again, Grant PUD appreciates WDFW's support in the continued development and review of the AISP for the Project.
		Page i, Executive Summary, paragraph 3	According to the definition of AIS species used in the Priest Rapids Aquatic Invasive Species Control and Prevention Plan, "Aquatic invasive species (AIS), defined by RCW 77.08.010, are described as any prohibited, regulated, unregulated, or unlisted aquatic animal or plant species, any aquatic weed on the state noxious weed control list adopted under RCW 17.10.080, and, as stated in RCW 77.60.130(1), any 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." WDFW does not support the statement that "No AIS species were encountered."	Comment noted. The statement "No AIS species were encountered" has been corrected to better reflect the results of the benthic surveys conducted during the drawn down conditions of Wanapum Reservoir in 2014.
		Page 1, Section 1.0, paragraph 3	Refer to [the] previous comment in regards to definition of AIS species.	Same as previous response.

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
		Page 5, Section 2.1.1, paragraph 3	WDFW can supply new AIS posters to replace old faded ones.	Comment noted. Grant PUD appreciates WDFW's willingness to help supply new AIS posters to replace old faded ones, but Grant PUD utilizes a unique sign board where the informational posters are not affixed, but rather printed directly onto the board itself, so new posters are not necessary at this time.
		Page 7, Section 2.1.2, paragraph 1	Great times for surveys - high boater effort.	Comment noted. Grant PUD chose the survey times for the voluntary boater surveys to be geared towards times with the highest boater turn-out for increased participation. More input = better data.
		Page 10, Section 3.1.3, paragraph 1	See previous comment in regards to the definition of AIS species.	Comment noted. The statement has been corrected to better reflect the results of the benthic surveys conducted during the drawn down conditions of Wanapum Reservoir in 2014.
		Page 14, Section 3.3, paragraph 1	Can a % of boaters who conduct self-surveys be determined?	Since Grant PUD does not track the number of available boaters that visit the Project, there is no accurate way to determine a percentage of boaters that chose to take a survey.
		Page 14, Section 3.3, paragraph 1	[[] would like to add boater state registration number to the survey.	Comment noted. This change will be made to the survey form before the next implementation season (2015).
		Page 14, Table 3, Title	[] would like to see these two categories separated because "been there" is a more reliable survey question than "going there".	Comment noted. This change will be made to the survey form before the next implementation season (2015).
		Page 14, Table 3, third row	In what state of the Columbia River?	Washington.
		Page 14, Table 3, fourth row	In what state of the Snake River?	Washington.
		Page 15, Section 4.0, paragraph 4.	See previous comment.	Comment noted. The statement has been corrected to better reflect the results of the benthic surveys conducted during the drawn down conditions of Wanapum Reservoir in 2014.