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May 28, 2019

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) – 2018 Aquatic Invasive Species Control and Prevention Plan (AISP) Annual Report

Dear Secretary Bose,

Please find enclosed the Public Utility District No. 2 of Grant County, Washington's (Grant PUD) annual report of the 2018 Aquatic Invasive Species Control and Prevention Plan Program (AISP Program). Activities conducted in 2018 were consistent with the requirements of the Aquatic Invasive Species Control and Prevention Plan (AISP), Article 401(a)(22) of the Priest Rapids Hydroelectric Project License¹ and associated obligations and mandates, including the Washington Department of Ecology (WDOE) 401 Water Quality Certification. The AISP Program activities for 2018 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. An amendment to the 2010 AISP was approved by FERC in October of 2016².

Grant PUD prepared and disseminated a draft summary of the 2018 Aquatic Invasive Species Control and Prevention Program activities for comment on March 1, 2019 to WDOE, WDFW and to members of the PRFF which includes WDOE, WDFW, U.S. Fish & Wildlife Service, Colville Confederated Tribes, Yakama Nation, the Columbia River Inter-Tribal Fish Commission, Bureau of Indian Affairs, the Confederated Tribes of the Umatilla Indian Reservation, and Wanapum People. No comments were received.

Grant PUD's annual AIS meeting was held on April 17, 2019. In this meeting, Grant PUD proposed adaptive management actions within the AIS Program which consisted of the introduction of environmental DNA (eDNA) technology as a monitoring technique for early detection of potential AIS,

¹ 123 FERC ¶ 61,049 (2008)

² 157 FERC ¶ 62,067 (2016)

including northern pike, within the AISP Program. No objections were noted from the stakeholders in including eDNA as an early detection method within the AISP Program. Additionally, Table 3 (Contact list for AIS response support) from the AISP (Grant PUD 2010) were updated to provide the most up-to-date regional AIS personnel to be notified in the event of a positive AIS identification within the Project. Both of these updates to the AIS management plan are included as Appendix D in this annual report.

FERC staff with any questions should contact me at 509-753-1468 or email rhendr1@gcpud.org.

Sincerely,



Ross Hendrick
Senior Manager – Environmental Affairs

CC: Breann Zimmerman – WDOE
David Bowen – WDOE
Patrick Verhey – WDFW
Jesse Schultz – WDFW

Priest Rapids Hydroelectric Project (P-2114)

**AQUATIC INVASIVE SPECIES
CONTROL AND PREVENTION PLAN:
2018
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 2019

Executive Summary

The Aquatic Invasive Species Control and Prevention Program (AISP Program) activities for 2018 were conducted in accordance with the management plan titled, *Aquatic Invasive Species Control and Prevention Plan* (AISP; Grant PUD 2010)¹ and associated amendments (Grant PUD 2016)².

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 Priest Rapids Hydroelectric Project (Project). Educational activities for 2018 included AIS informational signage at Project boat launches and distribution of outreach material at recreational stores. Monitoring activities for 2018 consisted of zebra/quagga mussel sampling (artificial substrate, plankton tows, and shoreline monitoring), aquatic plant surveys at Project boat launches and monitoring for the presence/absence of northern pike (*Exos Lucius*).

Northern pike are classified as a prohibited aquatic animal species per Washington State Revised Code 77.12.020 (RCW 77.12.020) and are considered a serious ecological threat if they become established within anadromous fish bearing waters in the Columbia River Basin. Northern pike are currently established in the Pend Oreille River and in Lake Roosevelt upstream of the Priest Rapids Project (~144 river miles (RM)).

Due to the threat of northern pike entering the Project via downstream movement and/or illegal introductions; Grant PUD implemented boat based electrofishing sampling in specific areas throughout the Priest Rapids Project in areas where one could expect to encounter northern pike if they were present. This included potential spawning and nursery areas, which were characterized as off the main river channel, shallow backwater areas where aquatic vegetation generally develops earlier and tributary mouths and inlets (e.g. Crab Creek). No northern pike were observed or collected through the expanded monitoring efforts in 2018.

In addition, over 800 separate locations using a myriad of fish collection techniques (electrofishing, beach seining, setlines and angling) were employed over various habitat types during 2018 within the Priest Rapids Project and no northern pike were collected. Additionally, no northern pike were collected during the fish ladder and turbine maintenance or observed passing through the fishways via the video fish counting system in 2018.

Results from the monitoring efforts in 2018 included no zebra/quagga mussel veliger identified in any plankton tow samples and no presence of zebra/quagga mussels or other macroinvertebrate AIS including New Zealand mudsnail (NZMS) on any artificial substrates or shoreline monitoring sites within the Project.

Results from the 2018 boat launch aquatic plant surveys within the Priest Rapids Reservoir were practically identical to the results from 2017. The only notable difference was the reappearance of curlyleaf pondweed at Huntzinger in 2018, a species that wasn't observed during the 2017 surveys, but had been at this location historically. Results for the Wanapum Reservoir differed from prior years' surveys (i.e. pre-drawdown reservoir), but continued to mirror results from post-drawdown conditions. The littoral zones of the Wanapum Reservoir boat launches were exposed during the Wanapum drawdown of 2014 and the aboveground portion of aquatic bed

¹ 132 FERC ¶ 62,016 (2010)

² 157 FERC ¶ 62,067 (2016)

vegetation all died off during this time period. Re-growth and/or re-colonization of some aquatic vegetation occurred at most Wanapum Reservoir boat launches by the following year (2015), although the amount of vegetation was less than prior years, and recolonization typically occurred first with native species. In 2018, all six of the Wanapum Reservoir boat launches had been recolonized with primarily native species, but also contained either Eurasian watermilfoil and/or curlyleaf pondweed (see Table 1) to a lesser extent.

Grant PUD's annual AIS meeting was held on April 17, 2019. In this meeting, Grant PUD proposed adaptive management actions within the AIS Program, which consisted of the introduction of environmental DNA (eDNA) technology as a monitoring technique for early detection of potential AIS, including northern pike, within the AISP Program.

No objections were noted from the stakeholders in including eDNA as an early detection method within the AISP Program. Additionally, Table 3 (Contact list for AIS response support) from the AISP (Grant PUD 2010) needs to be updated to provide the most up-to-date regional AIS personnel to be notified in the event of a positive AIS identification within the Project. Both of these updates to the AIS management plan will be included as Appendix D in this annual report.

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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 Program
CDFG	California Department of Fish and Game
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
NZMS	New Zealand Mudsail
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
WFB	Wanapum Fish Bypass
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology
WQC	Water Quality Certification

1.0 Introduction

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. 2114³ 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, amended on March 6, 2008 (WDOE 2007), and directly incorporated into the FERC license to operate the Project on April 17, 2008 (FERC 2008).

The Aquatic Invasive Species Control and Prevention Program (AISP Program) activities for 2018 were conducted in accordance with the management plan titled, *Aquatic Invasive Species Control and Prevention Plan* (AISP; Grant PUD 2010) and associated amendments (Keeler 2016). The AISP was initially 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 FERC license (FERC 2008). The original AISP was submitted to FERC on March 3, 2010 and was approved on July 7, 2010. In June of 2016, Grant PUD requested an amendment to the 2010 AISP to incorporate modifications to the monitoring frequencies, which was approved by FERC in October of 2016⁴.

This annual report summarizes activities conducted in implementation year 2018 under the AISP Program. Additionally, Grant PUD would like to propose the introduction of eDNA (environmental DNA) as a monitoring technique for early detection of AIS into the AISP Program for future years. The introduction of eDNA technology will be discussed further below (Section 4.0).

1.1 Objectives

As identified in the AISP, 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).

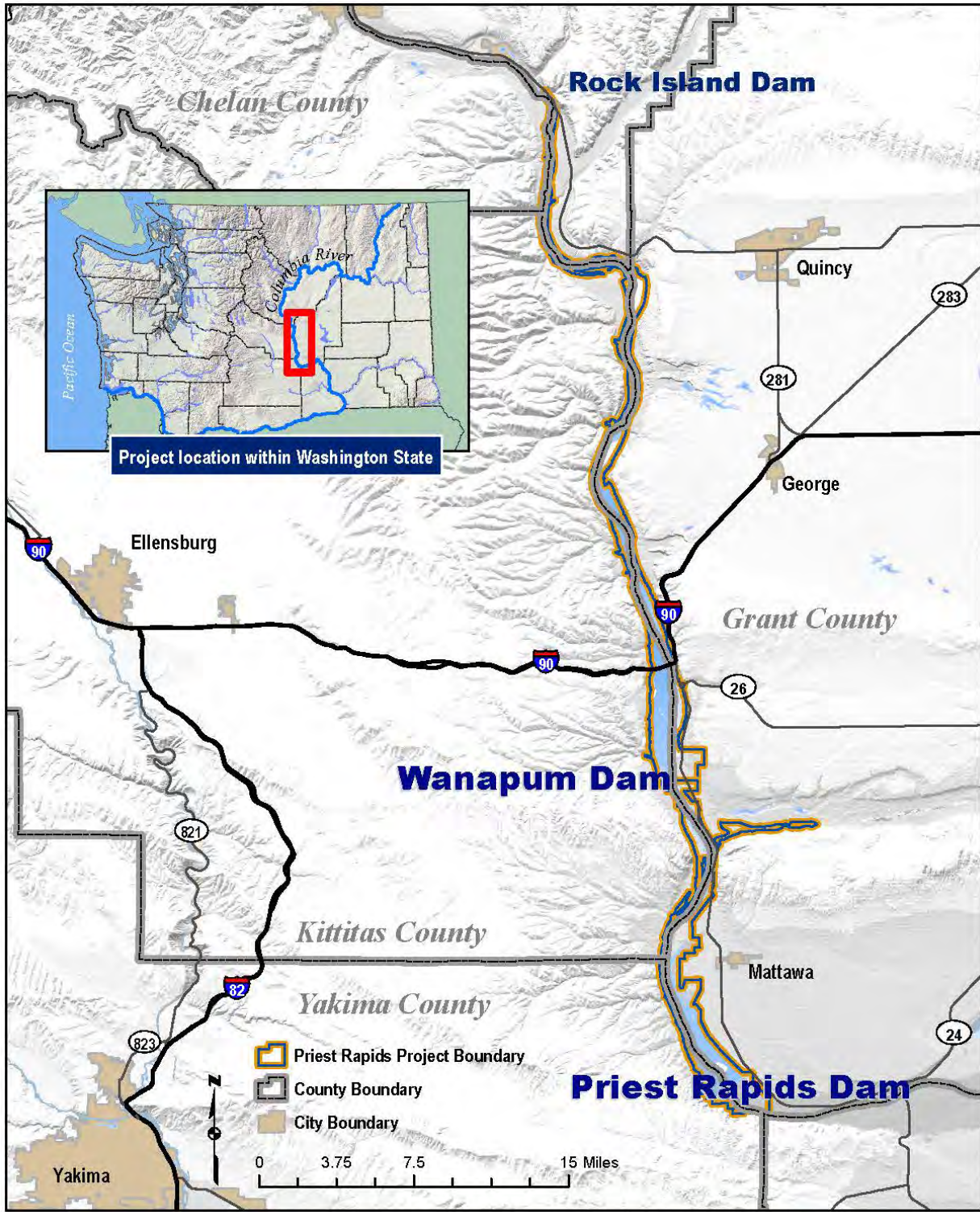
The Priest Rapids development consists of a 7,725-acre reservoir and a 10,103-foot-long by 179.5-foot-high dam spanning the Columbia River. The dam consists of left and right embankment sections; left and right concrete gravity dam sections; a left and right fish passage structure, each with an upstream fish ladder; a gated spillway; a downstream fish passage structure (the Priest Rapids Fish Bypass (PRFB)); and a powerhouse containing ten vertical shaft

³ 123 FERC ¶ 61,049 (2008)

⁴ 157 FERC ¶ 62,067 (2016)

integrated Kaplan turbine/generator sets with a total authorized installed capacity of 675 MW (best gate) (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 (the 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).



Priest Rapids Project *FERC Project #2114*



Figure 1 The Priest Rapids Hydroelectric Project with Project Boundary, 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 2018 for the AISP, including elements of education, monitoring, and local and regional coordination. Each of these activities are discussed in more detail below.

2.1 Education

The educational activities implemented as part of the AISP for 2018 included educational signage at Project boat launches and outreach material distributed at recreational stores.

2.1.1 Educational Signage and Outreach Material

Project boat launches outfitted with informational/educational signage during 2018 included Apricot Orchard, Crescent Bar (both on-island and off), Sunland Estates, Frenchman Coulee, Kittitas County (Vantage), Wanapum State Park, and Upper Wanapum on the Wanapum Reservoir, and Lower Wanapum, Huntzinger, Buckshot, and Desert Aire (Priest Rapids Recreation Area (PRRA)) on the Priest Rapids Reservoir.

Educational signage included the WDFW's AIS poster (WDFW 2011) and the WDOE advisory poster for Eurasian watermilfoil (WDOE 2011) (see Figure 4 below). Outreach material distributed at select recreational stores consisted of the 100th Meridian Initiative's *Zap the Zebra* brochure (100th Meridian Initiative 2011; Appendix A).

It is important to note that all Grant PUD Project boat launches, including newly developed launches that are in the process of being updated, will be outfitted with kiosks that will contain information about boater safety, boater regulations, recreational opportunities, wildlife, and AIS in the Project. All Project boat launches during 2018 consisted of the approximate configuration of informational and educational signage as the example displayed in Figure 4 below. The newest boat launch at Crescent Bar (Riverbend Park on-island boat launch) was officially completed in the winter of 2018 and was outfitted with signage similar to Figure 4 below.



Figure 4 Informational/Educational signage configuration at the Upper Wanapum boat launch, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

2.2 Monitoring

The monitoring activities implemented as part of the AISP for 2018 included zebra/quagga mussel sampling (including plankton tows, artificial substrates, and shoreline surveys), aquatic plant surveys at Project boat launches, and northern pike early detection monitoring. Descriptions of the monitoring activities applied during 2018 are presented in the following sections.

2.2.1 Zebra/Quagga Mussel Sampling

Zebra/quagga mussel(s) presence/absence were monitored throughout the Project by use of a plankton tow net and inspection of artificial substrates and visual shoreline surveys adjacent to artificial substrate locations. 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 throughout the Project. Samples were collected at Crescent Bar, Sunland Estates, Wanapum forebay, Crab Creek, and the Priest Rapids forebay. Samples were collected three times throughout the monitoring season (once in June, July and August of 2018, respectively).

Sample methods included the use of a Wisconsin plankton net (363 μ mesh net) 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 (Jesse Schultz, WDFW, pers. com).

After collection, samples were cataloged and shipped to Cameron Lange, a Senior Environmental Scientist located in the Great Lakes region of the United States 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 B.

2.2.1.2 Artificial Substrates

Grant PUD deployed artificial substrates at some high-traffic Project boat launch areas as an additional monitoring technique during 2018 to monitor for zebra and quagga mussels (and other AIS) near areas with high boater traffic. Boat launches selected for substrate deployment included Desert Aire (PRRA) in the Priest Rapids Reservoir and Kittitas County (Vantage), Sunland Estates, and Crescent Bar (off-island) in the 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 Schultz, WDFW, pers. com). One substrate was deployed at each site. 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 Shoreline Surveys

A brief (~10 minute) shoreline survey occurred adjacent to the same high traffic boat launches visited for the artificial substrate sampling schedule (see Section 2.2.1.2 above), and followed

protocols developed by the 100th Meridian Initiative – Columbia River Basin Team (WDFW Personal Comm.) to briefly survey the shoreline near boat launches for adult zebra/quagga mussels, or other adult AIS. Results from these surveys are presented in Section 3.1.3.

2.2.2 Aquatic Plant Surveys

Aquatic vegetation surveys conducted in 2018 focused on assessing aquatic plant distribution and species composition at the Project boat launches. Aquatic plant assessment transect locations were established in previous years at each Project boat launch.

For the 2018 aquatic vegetation surveys, geospatial data layers were compiled into a geodatabase, which included: the Project boundary, aerial imagery, bathymetric data, Project boat launch locations, and survey results from past field efforts, including the transects that were established at each boat launch. The geodatabase was uploaded on to a field computer running geographic information systems (GIS) and mobile Global Positioning System (GPS) and taken in to the field to perform the surveys for 2018. Field surveys were completed on August 15, 2018. Methods used to complete these surveys are described below.

2.2.2.1 Boat Launch Transect Survey Methods

Transect methodology generally followed the same protocol in 2018 as was completed during previous monitoring events, which were modified slightly from the original protocol from 2011 (Keeler 2012-2017), but consistent with AISP requirements (Grant PUD 2010). The AISP 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.

In accordance with the AISP, three transects were surveyed at each boat launch; however, four transects were surveyed at the Desert Aire (PRRA) boat launch due to its reconfiguration. Other boat launches have been reconstructed since surveys began (Frenchman Coulee, Vantage, Wanapum State Park, Wanapum Forebay, and Huntzinger) but not substantially reconfigured; therefore, transect locations were not modified at these boat launches. During surveys, aquatic vegetation was sampled periodically along each transect, and dominance or occurrence of invasive species (e.g., Eurasian watermilfoil or curlyleaf pondweed), native species, or no vegetation was recorded at each sample point. Boat launches surveyed within the Wanapum Reservoir included the following:

Apricot Orchard, Crescent Bar, Sunland Estates, Frenchman Coulee, Kittitas County (Vantage), Wanapum State Park and Upper Wanapum.

Boat launches surveyed within the Priest Rapids Reservoir included the following:

Lower Wanapum, Huntzinger, Buckshot and Desert Aire (PRRA).

Boat-based transect surveys were conducted using a field crew consisting of two Grant PUD biologists travelling in a motorized vessel. A field computer running GIS and mobile GPS software and loaded with the boat launch transect locations were used to record data along each

transect. Aquatic vegetation sampling were conducted either visually or using a sampling rake to collect samples from regularly spaced points along each transect. At each of these sampling locations, a GPS point with associated aquatic plant presence/absence and species composition data was recorded using the mobile GPS device. Rake samples were also examined for presence of potential macroinvertebrate AIS including quagga /zebra mussels and/or New Zealand mudsnails.

During the 2018 surveys, aquatic vegetation presence was recorded at each transect point as follows:

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

Results for the 2018 aquatic vegetation surveys are discussed in Section 3.2 and displayed in Figures C-1 through C-11 in Appendix C of this 2018 annual report.

2.2.3 Northern Pike Early Detection Monitoring

Presence/absence of northern pike within the Project were monitored using day-time boat based electrofishing in areas where one could expect to encounter northern pike if they were present. This included potential spawning and nursery areas, which are characterized as off the main river channel, shallow backwater areas where aquatic vegetation generally develops earlier and tributary mouths and inlets (e.g. Crab Creek). In addition, Grant PUD implements an extensive northern pikeminnow removal program utilizing set lines, beach seining, angling gear, and electrofishing. Other activities conducted by Grant PUD which also serve as a potential early detection program include: video fish count systems in the fishways (Wanapum and Priest Rapids dams), dewatering of fishladders and turbines (during maintenance), and an annual northern pikeminnow derby funded via the Priest Rapids Coordinating Committee, White Sturgeon Monitoring and Evaluation Program, and periodic native resident fish surveys.

2.2.3.1 Electrofishing

A Midwest Lake Management, Inc. (MLES) Infinity electrofishing boat consisting of the MLES Infinity control box, a Honda 240 volt AC generator and two six dropper Wisconsin ring with spherical or anode booms is used along transects characterized as off the main river channel, shallow backwater areas where aquatic vegetation generally develops earlier and tributary mouths and inlets (e.g. Crab Creek).

2.2.3.2 Setlines

Set lines are approximately 500 feet in length with hooks attached at equidistant intervals (approximately 5-ft. Each set line is composed of tarred Power Braided Twine No. 84. Both ends of the set line are equipped with an 8-lb cylindrical lead anchor, and 150-foot buoy lines which is attached upon deployment to mark the location and allow retrieval of the set line. Set line buoys are labeled with contact information and the current scientific collection permit number. The hook clips used on the set line consisted of a single-loop ground clip, a swivel, one foot of 10-lb test monofilament line, a size-10 winner day-glow float, and a No. 10 treble hook baited with a cricket. Light-weight monofilament is used to allow inadvertently caught larger non-target fish

such as white sturgeon (*Acipenser transmontanus*) to break away. Set lines are fished over a 24–48-hour period (typically) and recovered daily (depending on river/weather conditions).

2.2.3.3 Beach Seining

A beach seine fishery is conducted in the late summer and early fall annually. A 80-ft long, 6-ft deep beach seine with 1/8th in. mesh is used to remove age three and younger non-native piscivorous fish. Beach seining activities generally occurs in the Wanapum reservoir where juvenile northern pikeminnow and non-native piscivorous fish have been collected in previous years.

2.2.3.4 Angling

Angling efforts are conducted in tailrace directly below the transformer deck of Wanapum Dam using 8'6" spinning rods spooled with 30lb test and 10lb test leaders. Plastic fishing lures resembling juvenile salmonids are used.

In addition, the Priest Rapids Coordinating Committee fund an annual northern pikeminnow derby in Wanapum Reservoir to encourage anglers to remove northern pikeminnow and other non-native predators from the Priest Rapids Project Area. Standard angling equipment (rod and reel) is used by anglers over a 2 day period either during May or September.

2.2.3.5 Video Fish Counting

Annual adult fish-counting equipment at both Wanapum and Priest Rapids to provides reliable fish count to track trends for both resident and anadromous species and serves as an early detection or monitoring system for non-native species. The video fish-counting (VFC) system configuration at each dam has digital video cameras in each fishway streaming data to digital video recorders (DVRs) at each dam. These DVRs are networked and accessed by fish counters via PCs from the fish-counting room at Wanapum Dam. Data from the DVRs are played back and fish are identified and counted by the fish counters via a separate tallying program. Fish counting runs April 15 through November 15 of each year.

2.2.3.6 Fish Ladder and Turbine Dewatering

Dewatering of the fishways at Wanapum and Priest Rapids dams for inspection and maintenance is conducted annually during the periods of minimum fish migration (November 15 – March 31). Although infrequent, turbine dewatering for maintenance or rehabilitation occurs which allows Grant PUD staff to access and perform fish salvage activities within the dams. If northern pike were present within the fishways during salvage they would be observed and collected.

2.3 Local and Regional Coordination

Local and regional coordination activities in 2018 involved hosting Grant PUD's Annual Aquatic Invasive Species meeting and participation/attendance at a flowering rush summit. Grant PUD staff also participated in a regional northern pike forum.

2.3.1 Annual Aquatic Invasive Species Meetings

On April 18, 2018 and in accordance with the AISP, Grant PUD hosted its annual AIS meeting at its Wanapum Maintenance Center (WMC). 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. Attendees included Carson Keeler (Grant PUD), Jesse Schultz (WDFW via WebEx/conference line), and Marcie Clement (Chelan PUD). A PowerPoint was presented by Grant PUD on the results from the 2017 season along with a brief overview of the AISP activities to date. No modifications were deemed necessary by Grant PUD or the stakeholders for the 2018 implementation season.

2.3.2 Flowering Rush Summit

The Columbia River Basin Cooperative Weed Management group held a flowering rush summit in order to share current information on the distribution, ecology and management of flowering rush within the Columbia River Basin. Presentations focused on current management activities and options with a second half day of facilitated discussions focusing in on the current priorities.

2.3.3 Mid and Upper Columbia Interagency Northern Pike Forum

During 2018, Grant PUD staff participated in the Mid and Upper Columbia Interagency Northern Pike Forum. The goal of this forum was to share information about the historical and current northern pike introductions, presence and challenges and build a capacity for an effective, coordinated response to northern pike.

3.0 Results

The following sections provide results from activities conducted as part of the AISP in 2018, which includes outcomes from the zebra/quagga mussel sampling (plankton tows and artificial substrate/shoreline surveys), boat launch transect surveys and northern pike monitoring.

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, artificial substrates, and shoreline surveys 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 June – 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 Schultz, 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 2018).

No zebra mussels were found in any of the samples analyzed. A copy of each analysis was sent via email to WDFW during the 2018 season. See Appendix B of this annual report for results from samples analyzed during 2018.

3.1.2 Artificial Substrate/Shoreline Survey Results

During the same timeframe as the plankton tow samples were collected (June - September), artificial substrates and shoreline areas around the substrate locations were checked for presence/absence of zebra/quagga mussels or other AIS macroinvertebrate. A standard form

were supplied by WDFW to check for presence/absence of mussels (WDFW 2016). No presences of zebra/quagga mussels on any other macroinvertebrate AIS during the 2018 season were detected. Results were documented, scanned and sent via email to WDFW during 2018.

3.2 Aquatic Plant Survey Results

Results from the survey efforts put forth for mapping and tracking aquatic vegetation along transects at each Project boat launch are depicted in the following sections. Survey efforts during 2018 concentrated primarily on the boat launch transects that were recorded during previous survey efforts (Keeler 2012-2018).

3.2.1 Boat Launch Transect Results

Figures C-1 – C-11 illustrate results of aquatic vegetation mapping along transects established at each Project boat launch. Table 1 includes a summary of results for each boat launch. Each GPS point location along these transects represents a single sampling location where dominance, presence and/or absence of AIS and native aquatic vegetation were recorded based on visual observations and/or rake sampling within an approximate 4 meter by 2 meter plot located at the front of the boat. Where multiple species were present, the dominant species was recorded and additional species were noted as sub-dominant. 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 20 feet. This is consistent with the protocol for these surveys described in the AISP (Grant PUD 2010). Results presented in Table 1 are summarized as presence or absence of each species at each boat launch.

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

Year	Apricot Orchard			Crescent Bar			Sunland			Frenchman Coulee			Vantage			Wanapum State Park			Upper Wanapum			Lower Wanapum			Huntzinger			Buckshot			Desert Aire					
	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	EM	CP	NS			
2011				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															
2013				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x															
2014																																				
2015							x	x	x	x																										
2016				x			x		x	x	x	x	x	x																						
2017	x		x	x			x		x		x		x																							
2018	x	x	x	x			x		x		x		x																							

Notes:

1. EM = Eurasian watermilfoil; 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 the Wanapum drawdown: Crescent Bar, Sunland, Frenchman Coulee, Vantage, Wanapum State Park and Upper Wanapum.
4. Huntzinger boat launch was formally established between the 2013 and 2014 survey seasons and therefore was not sampled prior to 2014.
5. Apricot Orchard boat launch was formally established between 2016 and 2017 survey seasons, and therefore was not sampled prior to 2017.

Results from the 2018 boat launch aquatic plant surveys within the Priest Rapids Reservoir were practically identical to the results from 2017. The only notable difference was the reappearance of curlyleaf pondweed at Huntzinger in 2018, a species that wasn't observed during the 2017 surveys, but had been at this location historically (Table 1). Results for the Wanapum Reservoir differed widely from prior years' surveys, but continued to mirror results from post-drawdown conditions. The littoral zones of the Wanapum Reservoir boat launches were exposed during the drawdown of 2014 and the aboveground portion of aquatic bed vegetation all died off during this time period. Re-growth and/or re-colonization of some aquatic vegetation occurred at most Wanapum Reservoir boat launches by the following year (2015), although the amount of vegetation was less than prior years, and recolonization typically occurred first with native species. In 2018, all six of the Wanapum Reservoir boat launches had been recolonized with primarily native species, but also contained either Eurasian watermilfoil and/or curlyleaf pondweed (see Table 1) to a lesser extent.

3.3 Northern Pike Monitoring Results

During 2018, over 800 separate locations using a myriad of fish collection techniques (electrofishing, beach seining, setlines and angling) were employed over various habitat types during 2018 within the Project and no northern pike were collected. Additionally, no northern pike were collected during the fish ladder and turbine maintenance or observed passing through the fishways via the video fish counting system in 2018.

4.0 Adaptive Management

As noted in Section 7.0 of the AISP (Grant PUD 2010), adaptive management is a key component of the (continued) implementation of the AISP Program over the Project's license (through 2052). Therefore, Grant PUD would like to propose the introduction of eDNA (environmental DNA) technology as a monitoring technique for the early detection of AIS including northern pike and/or zebra/quagga mussel, or other AIS within the AISP Program. The introduction of eDNA technologies into the AISP Program will provide an additional monitoring technique that will be performed concurrently at selected plankton tow sites within both the Wanapum and Priest Rapids reservoirs. The information from the eDNA analyses will provide valuable information to Grant PUD and other invested stakeholders in a cost-effective manner.

5.0 Conclusion/Summary

Educational activities for 2018 included placement of outreach materials and signage at Project boat launches and placement of outreach material at major recreational outlet stores. Monitoring activities during 2018 consisted of zebra/quagga mussel sampling and aquatic plant surveys at Project boat launches. Results from the monitoring efforts in 2018 reported no zebra/quagga mussel veliger identified in any samples and no presence of zebra/quagga mussels or other macroinvertebrate AIS including New Zealand mudsnail (NZMS) on any artificial substrates within the Project. Results for boat launches surveys within the Project were also consistent with results from prior years.

Discussions about the introduction of eDNA to the AISP Program will take place at Grant PUD's annual AIS meeting in early to mid-April of 2019. Results from these discussions will be documented and included in the final AIS report, due to FERC by June 1, 2019.

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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.

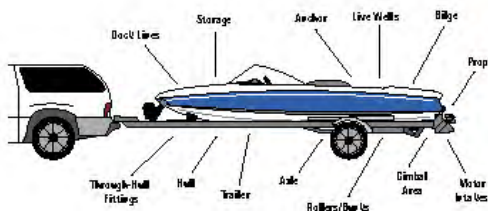
✓ Dry

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

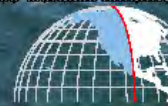


Image Credits: Zebra Mussels on a Fishing Lure by Marc Murrell, Kansas Department of Wildlife and Parks • Zebra Mussels, Zebra Mussels on a Bear Can, Zebra Mussels on a Native Mussel, Bear Bucket, Quagga Mussels, Zebra/Quagga Mussel Distribution January 2003 by David Burton, U.S. Fish & Wildlife Service • Zebra Mussels in a Car-Away Pipe by Don Schlosser, Great Lakes Science Center • Zebra Mussels in a Pipe by Craig Czamedel, 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 out-away pipe



Zebra mussels blocking a pipe

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

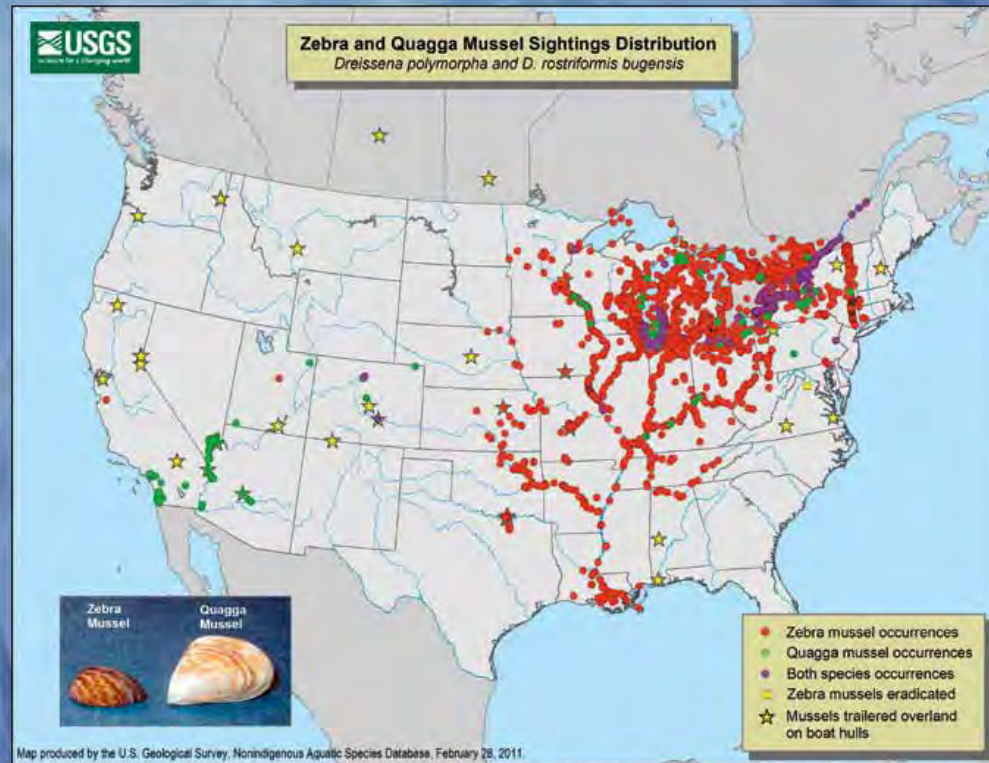
Once a boat has been in infested waters, it could carry invasive mussels. These mussels can spread to new habitats on boats trailered by commercial haulers or the public. Zebra and quagga mussels attach to boats and aquatic plants carried by boats. These mussels also commonly attach to bait buckets and 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 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
Zebra/Quagga Mussel veliger sample results during 2018
Priest Rapids Hydroelectric Project, mid-Columbia River, WA

Date	Reservoir	Location	Zebra Mussels	Corbicula	Prescreened	Comments
6/6/18	Wanapum	CB	No	No	No	
6/6/18	Wanapum	SE	No	No	No	
6/6/18	Wanapum	WF	No	No	No	
6/7/18	Priest Rapids	CC	No	Yes	No	
6/7/18	Priest Rapids	LG	No	No	No	
6/7/18	Priest Rapids	PRF	No	No	No	Few Ostracodes
7/25/18	Wanapum	WF	No	No	No	
7/25/18	Wanapum	SE	No	No	No	Many Cladocerans
7/25/18	Wanapum	CB	No	No	No	
7/26/18	Priest Rapids	CC	No	No	No	Some Ostracodes
7/26/18	Priest Rapids	LG	No	Few	No	Heavy Phytoplankton
7/26/18	Priest Rapids	PRF	No	No	No	
9/12/18	Wanapum	WF	No	No	No	Heavy Phytoplankton
9/12/18	Wanapum	SE	No	No	No	Many Cladocerans
9/12/18	Wanapum	CB	No	No	No	
9/13/18	Priest Rapids	CC	No	No	No	
9/13/18	Priest Rapids	LG	No	Few	No	
9/13/18	Priest Rapids	PRF	No	Few	No	
Notes:						
CB=Crescent Bar, SE=Sunland Estates, WF=Wanapum Forebay, CC=Crab Creek, LG=Lake Geneva, PRF=Priest Rapids Forebay						

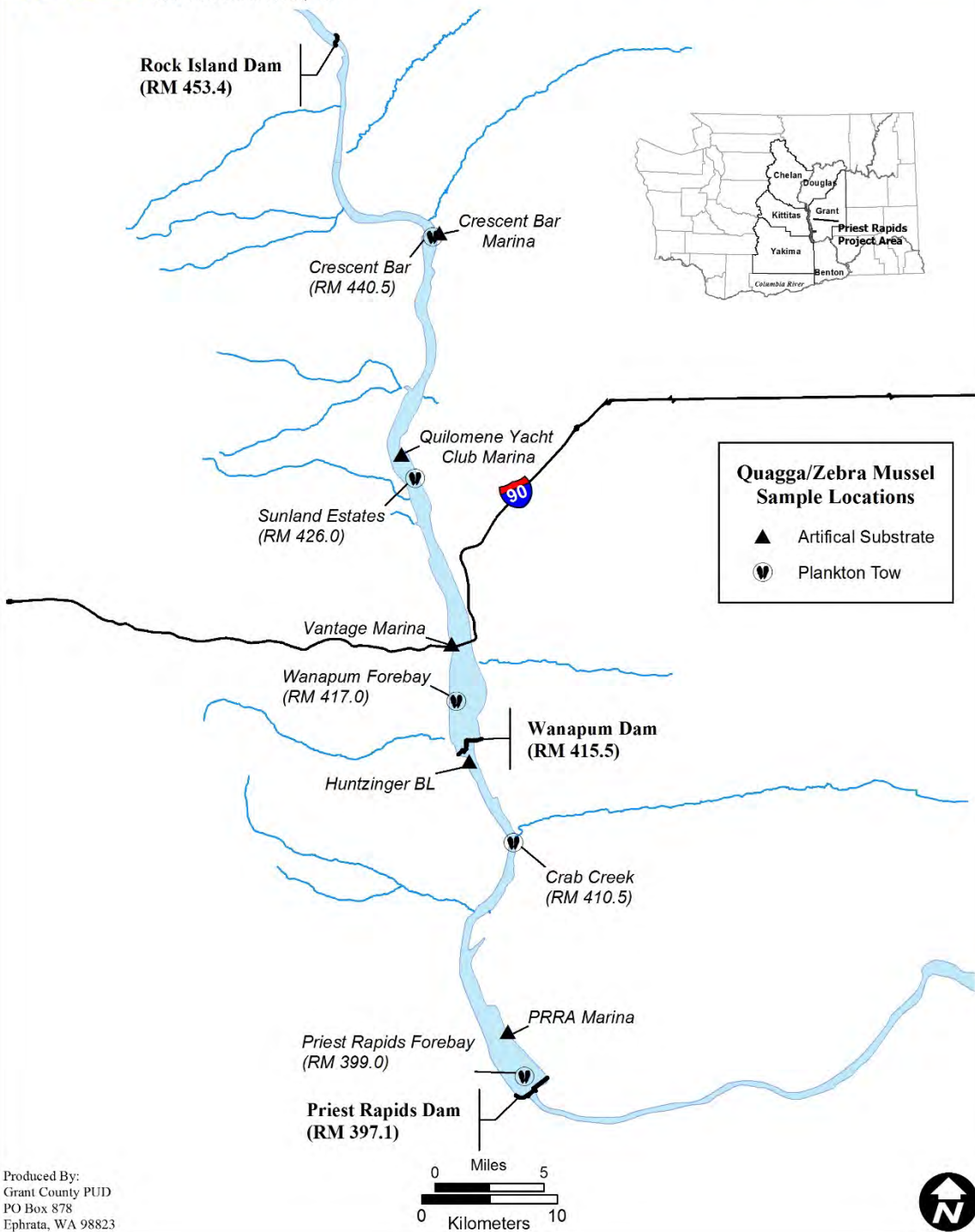


Figure 5 Quagga/Zebra Mussel Sample Locations, Priest Rapids Project, mid-Columbia River, WA.

Appendix C
Boat Launch Survey Map Series for 2018



Transect Data:
Occurrence of Aquatic Vegetation Species

● NS*	● EM*	● CP*
⊕ NS*, CP	● EM*, CP	⊗ CP*, EM
⊗ NS*, EM	● EM*, NS	⊕ CP*, NS
⊕ NS*, CP, EM	● EM*, NS, CP	⊗ CP*, EM, NS
		○ No Vegetation

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species

0 25 50 100 Feet



2018 Boat Launch Transects Apricot Orchard Boat Launch

AIS Species Mapping:
 Priest Rapids Project

This map/data was created for informational, planning, reference and guidance purposes only. Grant PUD makes no warranty, expressed or implied related to the accuracy or content of these materials. EA GIS - 2019

Figure C-1 Apricot Orchard Boat Launch Transects, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.



Transect Data:

Occurrence of Aquatic Vegetation Species

- | | | |
|-----------------|---------------|---------------|
| ● NS* | ● EM* | ● CP* |
| ⊕ NS*, CP | ⊕ EM*, CP | ⊗ CP*, EM |
| ⊗ NS*, EM | ● EM*, NS | ● CP*, NS |
| ⊕ NS*, CP, EM | ● EM*, NS, CP | ⊕ CP*, EM, NS |
| ○ No Vegetation | | |

NS = native species

EM = Eurasian watermilfoil

CP = curlyleaf pondweed

* indicates dominant species

0 25 50 100 Feet



2018 Boat Launch Transects
Crescent Bar Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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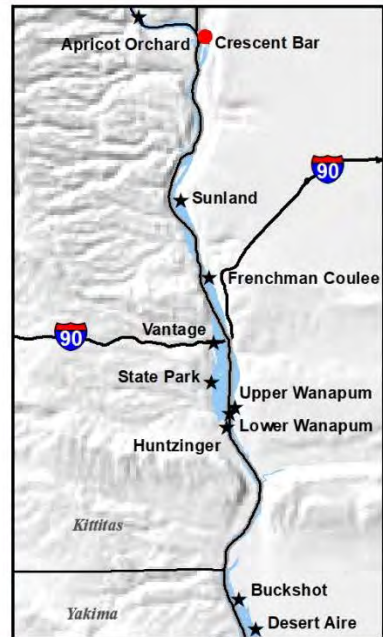


Figure C-2 Crescent Bar Boat Launch Transects, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.



Transect Data:
Occurrence of Aquatic Vegetation Species

● NS*	● EM*	● CP*
⊕ NS*, CP	⊕ EM*, CP	⊗ CP*, EM
⊗ NS*, EM	⊕ EM*, NS	⊕ CP*, NS
⊕ NS*, CP, EM	● EM*, NS, CP	⊕ CP*, EM, NS

○ No Vegetation

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species

0 50 100 200 Feet

N

2018 Boat Launch Transects
Sunland Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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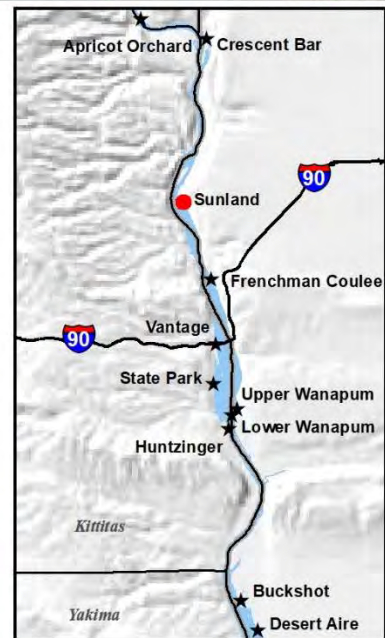


Figure C-3 Sunland Boat Launch Transects, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.



Transect Data:
Occurrence of Aquatic Vegetation Species

● NS*	● EM*	● CP*
⊕ NS*, CP	● EM*, CP	⊗ CP*, EM
⊗ NS*, EM	● EM*, NS	● CP*, NS
⊕ NS*, CP, EM	● EM*, NS, CP	⊕ CP*, EM, NS
○ No Vegetation		

NS = native species
EM = Eurasian watermilfoil
CP = curlyleaf pondweed
* indicates dominant species

0 37.5 75 150 Feet

N

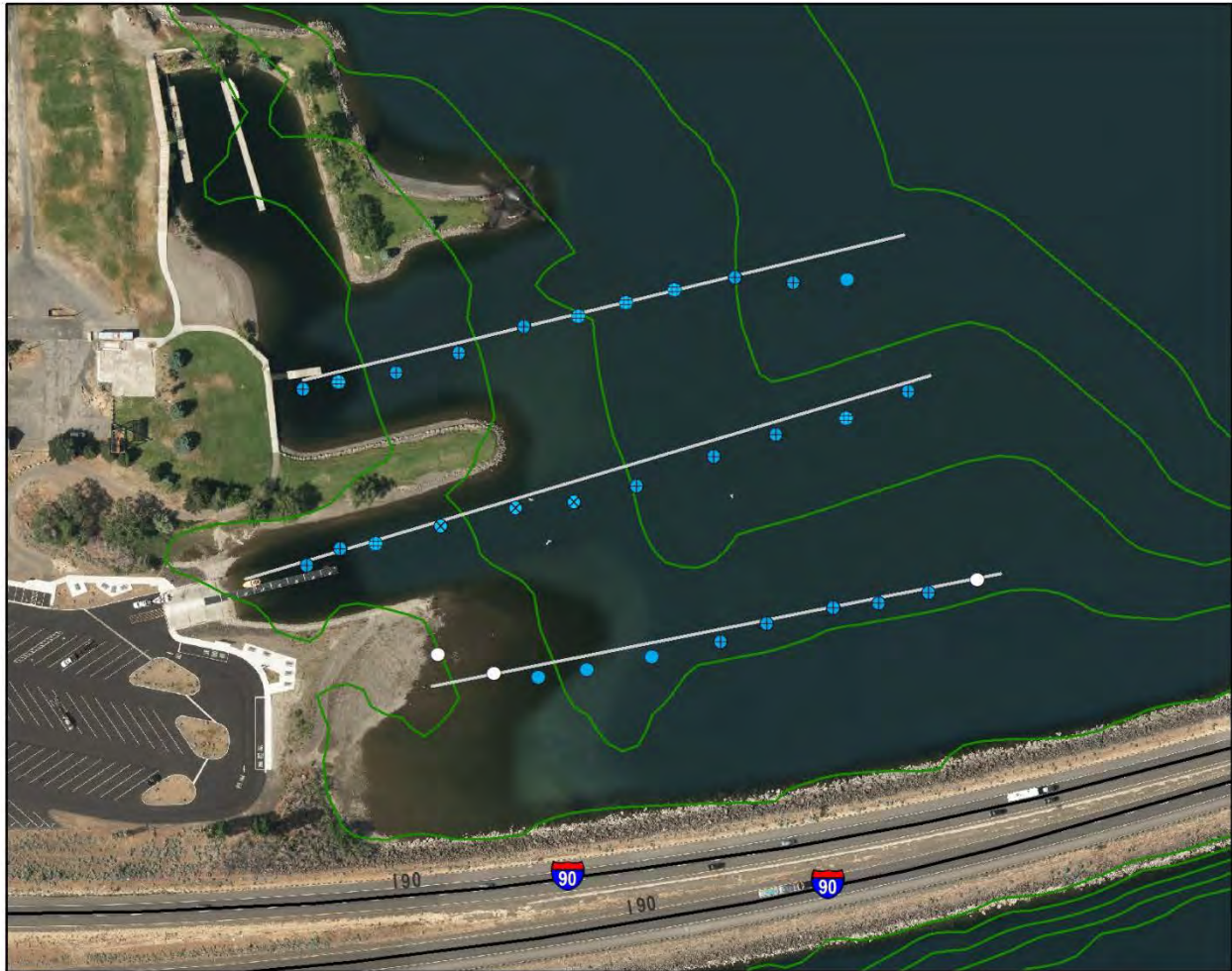
2018 Boat Launch Transects
Frenchman Coulee Boat Launch

AIS Species Mapping:
Priest Rapids Project

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Figure C-4 Frenchman Coulee Boat Launch Transects, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

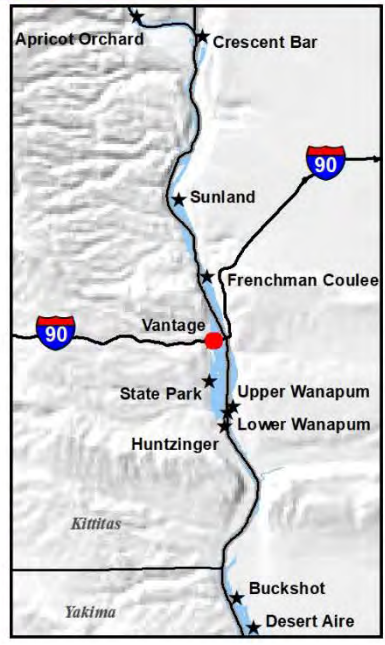
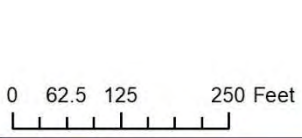


Transect Data:

Occurrence of Aquatic Vegetation Species

- | | | |
|-----------------|---------------|---------------|
| ● NS* | ● EM* | ● CP* |
| ⊕ NS*, CP | ⊕ EM*, CP | ⊗ CP*, EM |
| ⊗ NS*, EM | ⊕ EM*, NS | ⊕ CP*, NS |
| ⊕ NS*, CP, EM | ● EM*, NS, CP | ⊕ CP*, EM, NS |
| ○ No Vegetation | | |

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species



2018 Boat Launch Transects
 Kittitas (Vantage) Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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Figure C-5 Kittitas County (Vantage) Boat Launch Transects, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.



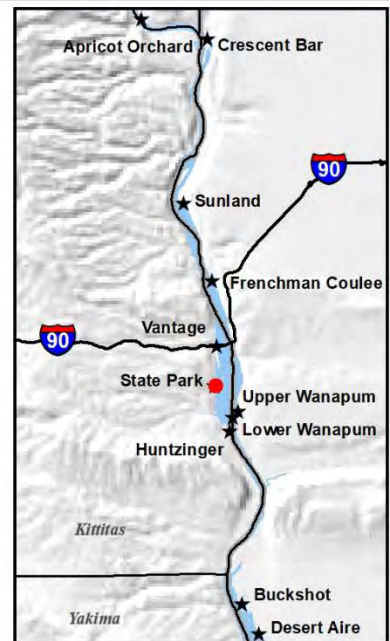
Transect Data:

Occurrence of Aquatic Vegetation Species

- | | | |
|---------------|---------------|-----------------|
| ● NS* | ● EM* | ● CP* |
| ⊕ NS*, CP | ⊕ EM*, CP | ⊗ CP*, EM |
| ⊗ NS*, EM | ⊕ EM*, NS | ⊕ CP*, NS |
| ⊕ NS*, CP, EM | ⊕ EM*, NS, CP | ⊕ CP*, EM, NS |
| | | ○ No Vegetation |

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species

0 25 50 100 Feet



2018 Boat Launch Transects

Wanapum State Park Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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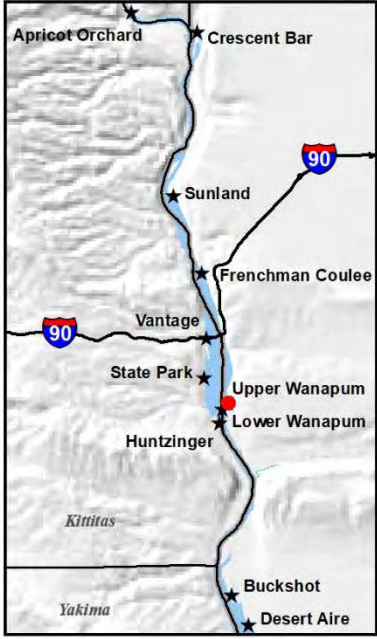
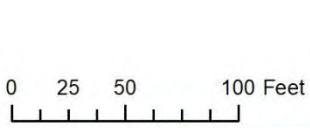
Figure C-6 Wanapum State Park Boat Launch Transects, Wanapum Reservoir, Priest Rapids Project, mid-Columbia River, WA.



Transect Data:
Occurrence of Aquatic Vegetation Species

● NS*	● EM*	● CP*
⊕ NS*, CP	⊕ EM*, CP	⊗ CP*, EM
⊗ NS*, EM	⊕ EM*, NS	⊕ CP*, NS
⊕ NS*, CP, EM	⊕ EM*, NS, CP	⊕ CP*, EM, NS
○ No Vegetation		

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species



2018 Boat Launch Transects
Upper Wanapum Boat Launch

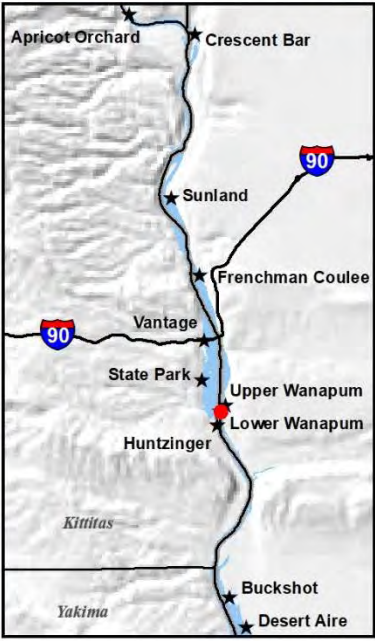
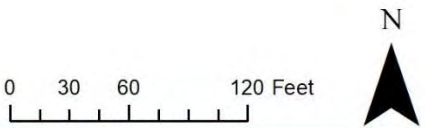
AIS Species Mapping:
 Priest Rapids Project

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Figure C-7 Upper Wanapum Boat Launch Transects, Wanapum Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.



- Transect Data:**
Occurrence of Aquatic Vegetation Species
- | | | |
|---------------|---------------|---------------|
| ● NS* | ● EM* | ● CP* |
| ⊕ NS*, CP | ⊕ EM*, CP | ⊗ CP*, EM |
| ⊗ NS*, EM | ● EM*, NS | ⊕ CP*, NS |
| ⊕ NS*, CP, EM | ● EM*, NS, CP | ⊕ CP*, EM, NS |
- No Vegetation
- NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species

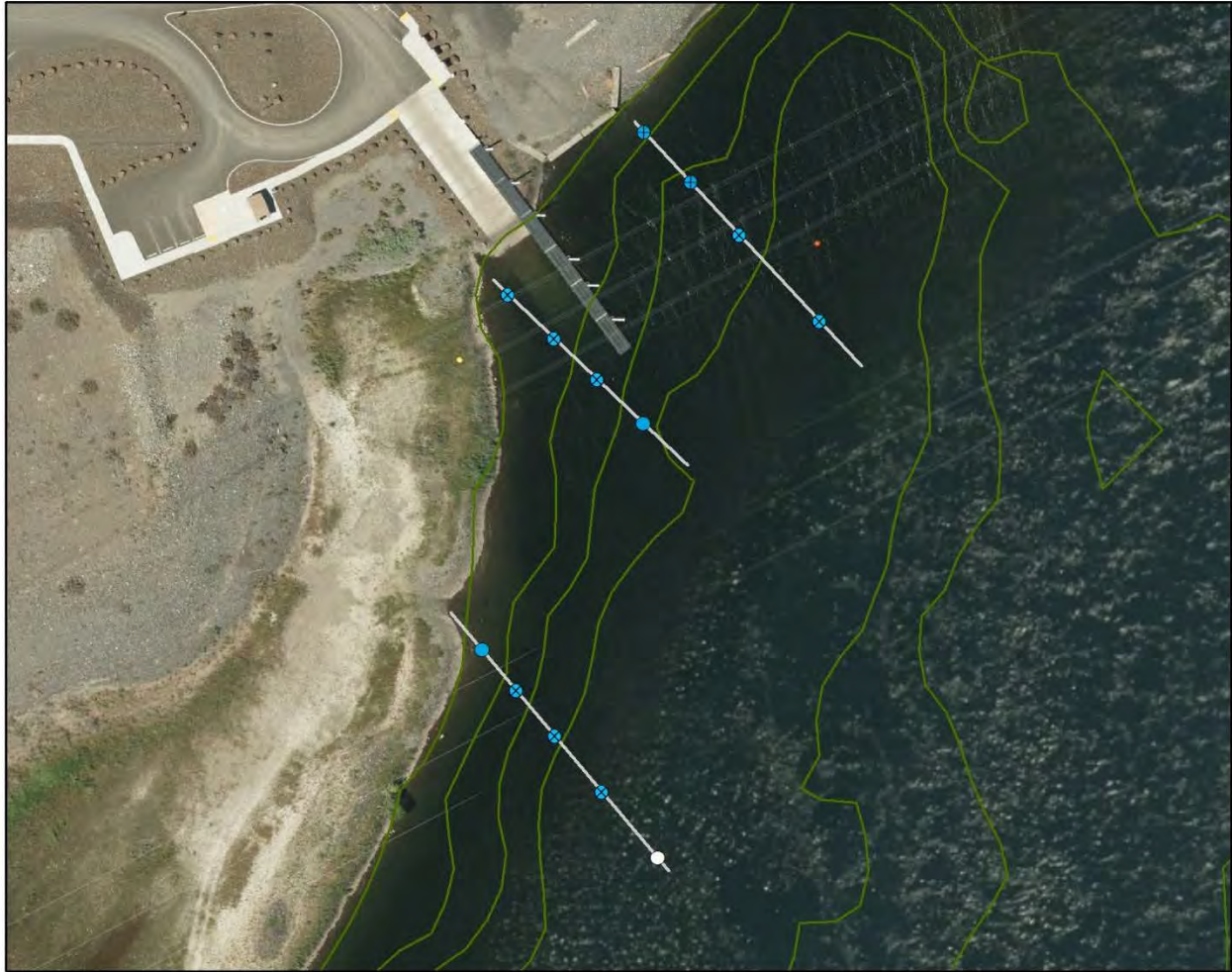


2018 Boat Launch Transects
 Lower Wanapum Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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Figure C-8 Lower Wanapum Boat Launch Transects, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

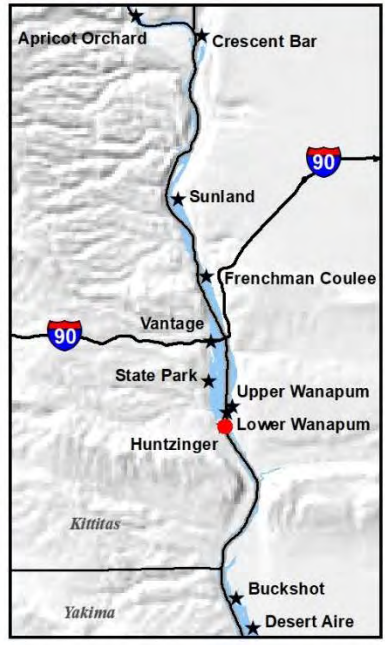
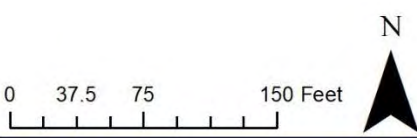


Transect Data:

Occurrence of Aquatic Vegetation Species

- | | | |
|-----------------|---------------|---------------|
| ● NS* | ● EM* | ● CP* |
| ⊕ NS*, CP | ⊕ EM*, CP | ⊗ CP*, EM |
| ⊗ NS*, EM | ⊕ EM*, NS | ⊕ CP*, NS |
| ⊕ NS*, CP, EM | ● EM*, NS, CP | ⊕ CP*, EM, NS |
| ○ No Vegetation | | |

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species



2018 Boat Launch Transects
Huntzinger Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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Figure C-9 Huntzinger Boat Launch Transects, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

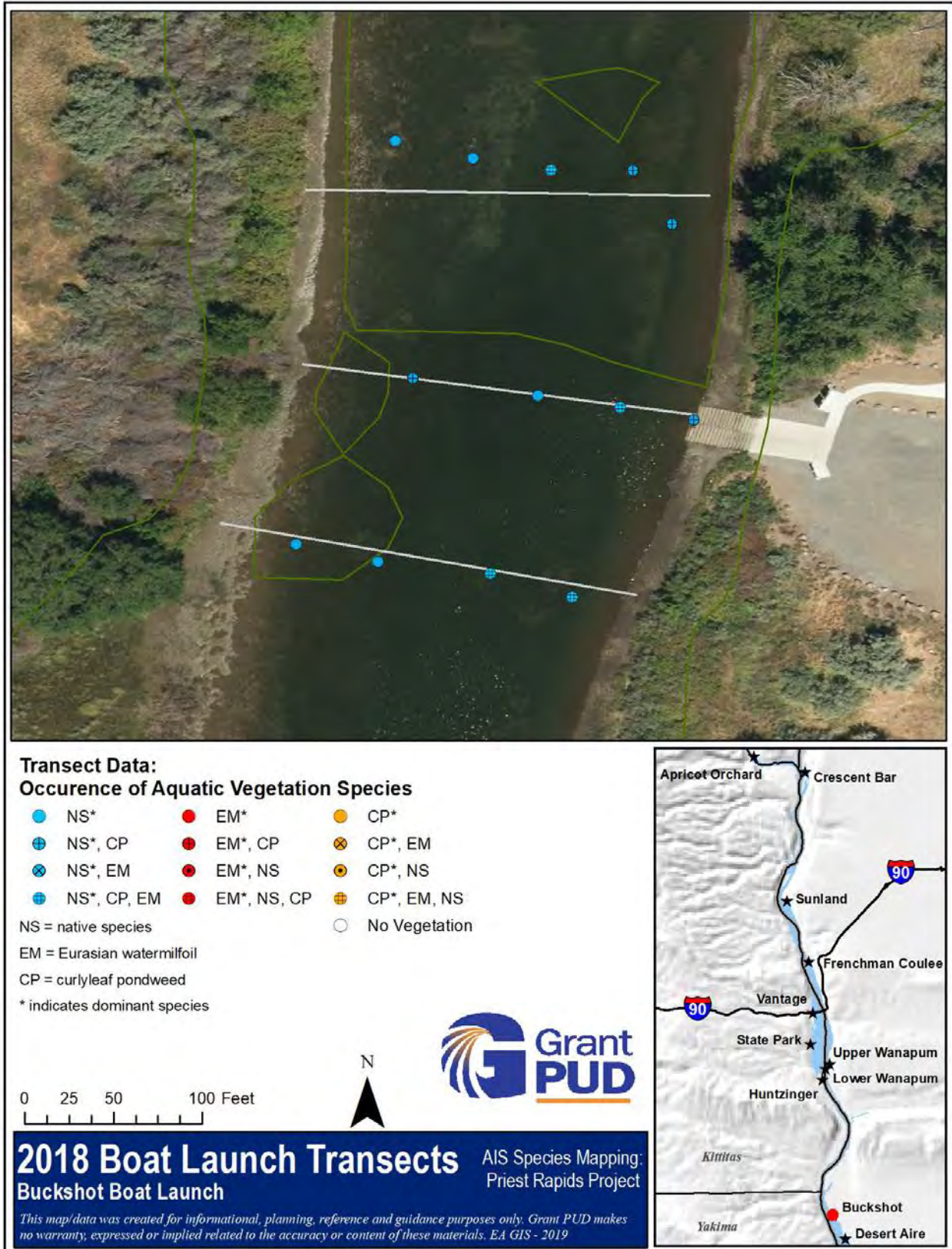


Figure C-10 Buckshot Boat Launch Transects, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

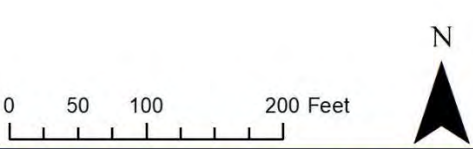


Transect Data:
Occurrence of Aquatic Vegetation Species

● NS*	● EM*	● CP*
⊕ NS*, CP	⊕ EM*, CP	⊗ CP*, EM
⊗ NS*, EM	⊕ EM*, NS	⊕ CP*, NS
⊕ NS*, CP, EM	⊕ EM*, NS, CP	⊕ CP*, EM, NS

○ No Vegetation

NS = native species
 EM = Eurasian watermilfoil
 CP = curlyleaf pondweed
 * indicates dominant species



2018 Boat Launch Transects
Desert Aire (PRRA) Boat Launch

AIS Species Mapping:
 Priest Rapids Project

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Figure C-11 Desert Aire (PRRA) Boat Launch Transects, Priest Rapids Reservoir, Priest Rapids Hydroelectric Project, mid-Columbia River, WA.

Appendix D
Grant PUD's Aquatic Invasive Species Program: 2019 Management Plan Update

Management Plan Update

Northern pike are classified as a prohibited aquatic animal species per Washington State Revised Code 77.12.020 (RCW 77.12.020) and are considered a serious ecological threat within anadromous fish bearing waters in the Columbia River Basin. Northern pike are currently established in the Pend Oreille River and in Lake Roosevelt upstream of the Priest Rapids Project (Project; ~144 river miles (RM) upstream).

To help bolster the early detection methods currently deployed for northern pike within the Project, Grant PUD proposed the introduction of environmental DNA (eDNA) as an early detection monitoring technique within the AISP Program. The introduction of eDNA technologies were noted in the draft 2018 AISP Report that was emailed on March 1, 2018 to different stakeholders including the Washington Department of Ecology (WDOE), Washington Department of Fish and Wildlife (WDFW), and members of the Priest Rapids Fish Form (PRFF) which includes WDOE, WDFW, U.S. Fish & Wildlife Service, Colville Confederated Tribes, Yakama Nation, the Columbia River Inter-Tribal Fish Commission, Bureau of Indian Affairs, the Confederated Tribes of the Umatilla Indian Reservation, and the Wanapum Tribe. In addition, the introduction of eDNA technology were presented and discussed during the annual AIS stakeholder meeting (which included representatives from both WDOE and WDFW) on April 17, 2019. There were no comments or objections to the introduction of eDNA to the AISP during the draft report consultation period or during the annual AIS stakeholder meeting.

Therefore, Grant PUD will begin using eDNA technologies as an early detection monitoring technique within the AISP Program starting in 2019.

Contact List Update

To ensure that the correct AIS personnel are contacted in the event of positive identification of new AIS within the Project, the AIS management plan Table 3 (Contact list for AIS response support) needs to be updated to the following table:

Table D-1 Contact List for AIS Response Support.

Contact	Name	Phone	Email Address
WDFW	Allen Pleus	360-902-2724	allen.pleus@dfw.wa.gov
	Jesse Schultz	360-902-2184	jesse.schultz@dfw.wa.gov
	Cpt. Eric Anderson	360-640-0493	eric.anderson@dfw.wa.gov
	Patrick Verhey	509-754-4624	patrick.verhey@dfw.wa.gov
WDOE	Jenifer Parsons	509-457-7136	jenp461@ecy.wa.gov
	Breean Zimmerman	509-575-2808	bzim461@ecy.wa.gov
Chelan PUD	Marcie Clement	509-661-4186	marcie.clement@chelanpud.org
	Michelle Smith	509-661-4180	michelle.smith@chelanpud.org
Corps	Pam Kromholtz	206-764-3491	pam.kromholtz@usace.army.mil
	Madelyn Martinez	206-764-6940	madelyn.t.martinez@usace.army.mil