

**PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY**

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February 19, 2010

**VIA ELECTRONIC FILING**

Honorable Kimberly D. Bose, Secretary  
Nathaniel J. Davis, Sr., Deputy Secretary  
FEDERAL ENERGY REGULATORY COMMISSION  
888 First Street, NE  
Washington, DC 20426

Subject: Rocky Reach Hydroelectric Project, FERC No. 2145  
Article 401 and Appendix A, Section 5.6(2) – Aquatic Invasive Species  
Monitoring and Control Plan

Dear Secretary Bose and Deputy Secretary Davis:

The Federal Energy Regulatory Commission (Commission or FERC) issued the “Order on Offer of Settlement and Issuing New License” (License) and “Order on Rehearing and Clarification” for the Rocky Reach Hydroelectric Project No. 2145 (Project) on February 19, 2009, and May 21, 2009, respectively. In accordance with License Article 401 and Certification Condition Number 5.6(2) of Appendix A – Section 401 Water Quality Certification of the License, the Public Utility District No. 1 of Chelan County (Chelan PUD) is required to file a Aquatic Invasive Species Monitoring and Control Plan (AIS Monitoring and Control Plan) within one year of License issuance with the Commission.

Chelan PUD hereby files the AIS Monitoring and Control Plan for the Rocky Reach Project to monitor for presence of new invasive species at or near Project facilities. The Plan was coordinated with the Washington Department of Ecology's Freshwater Aquatic Weed Control Program. The Plan includes the following components:

- a) Signage at boat launches and distribution of educational materials and boater questionnaires to voluntary participants at Rocky Reach Reservoir boat launch sites during the peak boating season (May 1-October 30 each year) to increase boater awareness of dangers of spreading AIS, including the methods one can take to decrease the spread of AIS (e.g., clean the weeds off the boat and drain the live well before going to a new waterbody); and

*Ms. Kimberly D. Bose and Mr. Nathaniel J. Davis, Sr.  
Federal Energy Regulatory Commission*

- b) Methodology and schedule of prevention, monitoring and control measures to regarding the presence and movement of AIS at or near Project facilities; and
- c) An annual report of monitoring and educational activities conducted each year.

Appendix B provides the record of consultation with the Rocky Reach Fishery Forum in preparing the Plan.

If you have any questions or require additional information, please contact me or Waikele Hampton at (509) 661-4627.

Sincerely,



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Enclosures: Final Aquatic Invasive Species Monitoring and Control Plan

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# **2010 AQUATIC INVASIVE SPECIES MONITORING AND CONTROL PLAN**

**FINAL**

**ROCKY REACH HYDROELECTRIC PROJECT  
FERC Project No. 2145**

**February 19, 2010**



**Public Utility District No. 1 of Chelan County  
Wenatchee, Washington**

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## **TABLE OF CONTENTS**

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|   |           |
|---|-----------|
| <b>EXECUTIVE SUMMARY .....</b>                    | <b>1</b>  |
| <b>SECTION 1: INTRODUCTION .....</b>              | <b>2</b>  |
| 1.1 Pathways for AIS Introduction.....            | 6         |
| <b>SECTION 2: EDUCATIONAL OUTREACH .....</b>      | <b>7</b>  |
| 2.1 Educational Materials.....                    | 7         |
| 2.2 Voluntary Self-Survey.....                    | 7         |
| <b>SECTION 3: AIS PLANT MONITORING.....</b>       | <b>10</b> |
| 3.1 Shoreline Monitoring .....                    | 10        |
| 3.2 Boat Launch Monitoring .....                  | 10        |
| 3.3 Control/Management.....                       | 11        |
| <b>SECTION 4: AIS ANIMAL MONITORING.....</b>      | <b>13</b> |
| 4.1 Fish.....                                     | 13        |
| 4.2 Zebra and Quagga Mussels .....                | 13        |
| 4.3 New Zealand Mudsnaail .....                   | 14        |
| <b>SECTION 5: RESPONSE AND COORDINATION .....</b> | <b>16</b> |
| <b>SECTION 6: ADAPTIVE MANAGEMENT .....</b>       | <b>17</b> |
| <b>SECTION 7: REPORTING .....</b>                 | <b>18</b> |
| <b>SECTION 8: IMPLEMENTATION SCHEDULE .....</b>   | <b>19</b> |
| <b>SECTION 9: CONCLUSIONS .....</b>               | <b>20</b> |
| <b>LITERATURE CITED .....</b>                     | <b>21</b> |
| <br><b>APPENDIX A: VOLUNTEER BOATER SURVEY</b>    |           |
| <br><b>APPENDIX B: CONSULTATION RECORD</b>        |           |

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## ***LIST OF TABLES***

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|  |    |
|--|----|
| Table 3-1. AIS Plants that will be Monitored for in the Columbia River as Part of the Rocky Reach Project..... | 10 |
| Table 4-1. Introduced Fish Species Found in the Rocky Reach Project.....                                       | 13 |
| Table 5-1. Contact List for AIS Response.....  | 16 |
| Table 8-1. Implementation Schedule.....  | 19 |

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## ***LIST OF FIGURES***

---

|   |   |
|---|---|
| Figure 1-1. Project Area.....   | 4 |
| Figure 1-2. Aerial View of Rocky Reach Dam.....   | 5 |
| Figure 2-1. Proposed Locations of Potential Educational Materials and Zebra Mussel Sampling on the Lower Reach<br>of the Rocky Reach Reservoir..... | 8 |
| Figure 2-2. Proposed Locations of Potential Educational Materials and Zebra Mussel Sampling on the Upper Reach<br>of the Rocky Reach Reservoir..... | 9 |

## *EXECUTIVE SUMMARY*

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The Public Utility District No. 1 of Chelan County (Chelan PUD) owns and operates the Rocky Reach Hydroelectric Project (Project) on the Columbia River. The Project is operated under the terms and conditions of Federal Energy Regulatory Commission (FERC) Hydroelectric Project License No. 2145.

Chelan PUD currently operates the Project through the coordinated operation of the seven-dam system and other Columbia Basin entities with current operational agreements with the fishery agencies, tribes and other operators to provide protection and enhancement for a range of fisheries within, and downstream of the Project. These agreements include the Hanford Reach Fall Chinook Protection Plan, the Hourly Coordination Agreement, and the Rocky Reach Habitat Conservation Plan (HCP) (and associated Anadromous Fish Agreement). The Project is also subject to the provisions of its FERC License (License), which includes several provisions of the 2006 Rocky Reach Comprehensive Settlement Agreement, and related laws and regulations. Additionally, the Project is subject to the requirements (incorporated by reference in the License) of the Biological Opinion for the Project issued by National Marine Fisheries Service (NMFS) for its effects on anadromous salmon, the Clean Water Act Section 401 Water Quality Certification issued by the Washington Department of Ecology (WDOE), and the Biological Opinion issued by the U.S. Fish and Wildlife Service regarding the effects of the Project on bull trout.

The WDOE issued a Final 401 Water Quality Certification (401 Certification) on April 4, 2006, for the operation of the Project. Under the 401 Certification, Section 5.6(2), Chelan PUD is required, in consultation with the Rocky Reach Fish Forum (RRFF), to develop and implement an Aquatic Invasive Species (AIS) Monitoring and Control Plan (Monitoring Plan) within one year of effective date of the new License. The Monitoring Plan shall also be coordinated with WDOE's Freshwater Aquatic Weed Control Program. The plan is also required under License Article 401(a) and must be approved both by WDOE and by FERC prior to implementation.

The following Monitoring Plan contains education, monitoring, and control components intended to meet the requirements of the 401 Certification. The educational components include placement of informational materials at Project boat launches, as well as voluntary boater surveys. These efforts will help inform the public about the risks of AIS transport and ways they can help or reduce those risks. Additionally, boater surveys will provide Chelan PUD with information related to the level of risk of AIS transport into the Project, and may help to guide monitoring and response efforts. The monitoring component includes annual zebra/quagga mussel monitoring, annual plant surveys at Project boat launches, and biennial Project-wide shoreline surveys. These monitoring efforts are intended to help provide identification of new AIS introduced into the Project, and may also provide an opportunity to respond to such an introduction prior to the species becoming established. Monitoring will also provide tracking information related to potential control/eradication efforts for a given AIS.

## SECTION 1: INTRODUCTION

Public Utility District No. 1 of Chelan County, Washington (Chelan PUD) owns and operates the Rocky Reach Hydroelectric Project (Project), located on the Columbia River (Figure 1). The Project boundary, which extends for about 43 miles along the Columbia River, begins at the Project tailrace (River Mile [RM] 474) and extends upriver to the Wells Dam tailrace at RM 516 (Figure 1).

The Project consists primarily of an 8,235-acre reservoir; a 2,847-foot-long by 130-foot-high concrete gravity dam spanning the river, including a powerhouse and spillway; a juvenile fish bypass system, and hatchery facilities.

On February 19, 2009 the Federal Energy Regulatory Commission (FERC) issued its Order On Offer of Settlement and Issuing New License (License) for the Rocky Reach Hydroelectric Project for a term of 43 years to Chelan PUD (License term ends February 1, 2052). Article 401 of the License order, *Commission Approval and Filing of Amendments*, requires the following:

*Two conditions of this license found in Washington Department of Ecology's (Washington Ecology) water quality certification (Appendix A) require the licensee to prepare and implement plans without prior Commission approval. Each such plan shall be submitted to the Commission for approval prior to implementation. These plans are listed below.*

| No. | Certification Condition Number | Plan Name  | Due Date  |
|-----|--------------------------------|--|---|
| 1   | 5.6(2)                         | Aquatic Invasive Species Monitoring and Control Plan | Within 1 year of license issuance                         |
| 2   | 5.7(1) &(2)                    | Quality Assurance Project Plan                       | Within 1 year of license issuance and annually thereafter |

*The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee shall implement the plan or changes in project operations or facilities, including any changes required by the Commission.*

Additionally, Section 5.6(2) of the 401 Water Quality Certification (401 Certification) issued by Ecology on April 4, 2006, requires the following:

*Within one year of the effective date of the New License, in consultation with the RRF, Chelan PUD shall develop and begin implementation of an AIS Monitoring and Control Plan (Monitoring Plan) for the Rocky Reach Project, to monitor for presence of new invasive species at or near Project facilities. The Monitoring Plan shall be coordinated with the Ecology's Freshwater Aquatic Weed Control Program. The Monitoring Plan and implementation shall include the following components:*

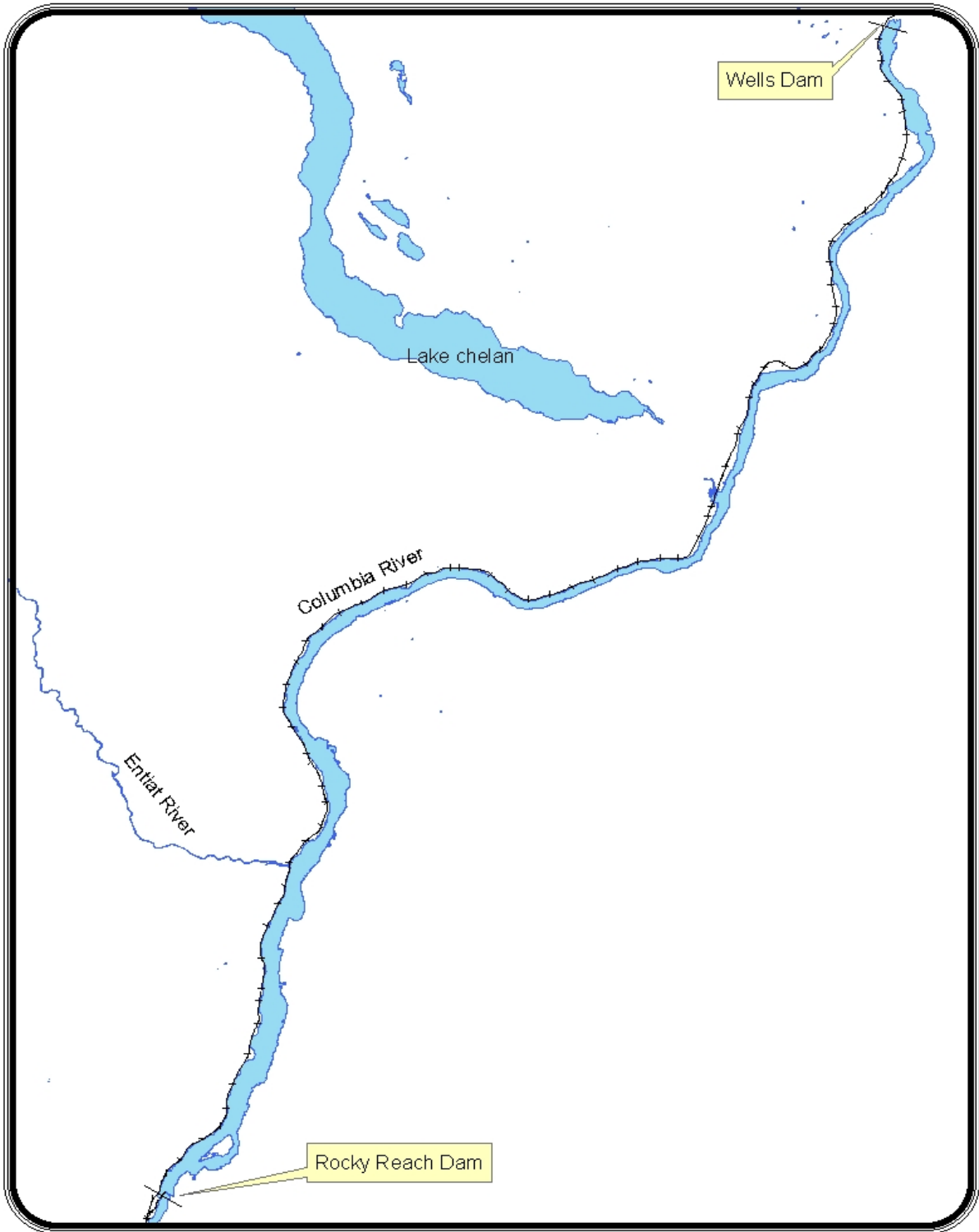
- a) Signage at boat launches and distribution of educational materials and boater questionnaires to voluntary participants at Rocky Reach Reservoir boat launch sites during the peak boating season (May 1 -October 30 each year) to increase boater awareness of dangers of spreading AIS, including the methods one can take to decrease the spread of AIS (e.g., clean the weeds off the boat and drain the live well before going to a new waterbody).*
- b) Methodology and schedule of prevention, monitoring and control measures regarding the presence and movement of AIS at or near Project facilities.*
- c) An annual report of monitoring and educational activities conducted each year.*

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.

This Monitoring Plan focuses on addressing ways to monitor and manage aquatic invasive flora and fauna in the Project. Key components of this Monitoring Plan include education, monitoring, and control that are designed to help manage, control, and potentially prevent introduction and spread of new AIS within the Project area. This Monitoring Plan will be updated annually based on results from the previous year's education, monitoring, and control efforts and will be in effect for the term of the FERC operating license for the Project (currently set to expire in February 2052).



**Figure 1-1. Project Area.**



**Figure 1-2. Aerial View of Rocky Reach Dam.**

## **1.1 Pathways for AIS Introduction**

Infestation of AIS can come through several different pathways, which is dependent on the use characteristics of a given waterbody (including upstream and downstream uses), and potential risks associated with each of those uses. For the Rocky Reach Project area, the following pathways have been identified as being the most likely pathways for AIS introduction or spread.

Chelan PUD will continue to monitor and research potential new pathways not identified in this Monitoring Plan that may need to be addressed through the annual updates of the Plan. This may include participation in regional AIS forums (e.g. Columbia River Task Force) and meetings with WDOE and Washington Department of Fish and Wildlife (WDFW) staff, which will include discussions of potential new AIS pathways potentially applicable to the Project area.

### ***1.1.1 Recreation***

One of the primary methods of infestation for AIS is through transport on recreational boating vessels. AIS can become entangled or attached to the boat hull, motor, propeller, jet-intake, and/or trailer and will be unknowingly transported and introduced into a new water body. This kind of activity can result in a rapid spread and infestation of AIS. Recreational and commercial fishing activities can also increase the threat of AIS introductions. For example, the New Zealand mudsnail is commonly transported by fisherman on their waders, and other AIS species can be introduced when fisherman empty their bait buckets into the receiving waters. Because the primary method of infestation for several AIS is through transport from recreational boating or fishing activities, prevention of AIS infestation through public education is one of the most widely used proactive approaches to managing and/or preventing AIS infestations. Therefore, Chelan PUD will use education, monitoring, and response as its primary methods to reduce new AIS infestations within the Project. Chelan PUD will also monitor and manage AIS that already exist in the Project. See Sections 2 - 5 additional information on Chelan PUD's AIS education, monitoring, and control activities.

### ***1.1.2 Flows Approaching the Project from Upstream***

Because the Project is located within an open river system, AIS can flow into the Project area from upstream locations. Close coordination with Public Utility District No. 1 of Douglas County (Douglas PUD), which owns and operates the next hydroelectric project upstream of Rocky Reach, will be done as part of this Monitoring Plan to help identify potential upstream introductions and coordinate response actions.

### ***1.1.3 Tributary/Irrigation Return Flows***

Incoming flows from tributaries and irrigation return flows are also possible pathways for AIS introductions. Some of the water sources that drain into these tributaries and irrigation return flows receive heavy recreation use and are therefore subject to AIS introduction and potential transport into the Project area. As described in Section 3 of this Monitoring Plan, Chelan PUD will conduct AIS monitoring and control activities intended to provide early detection of new AIS introductions and control existing AIS within the Project area.

### ***1.1.4 Planting of Ornamental Pond Plants and Dumping of Unwanted Pets and Ornamental Plants***

Intentional planting of ornamental plants and dumping of unwanted pets (e.g., fish, frogs, snakes) or ornamental plants is yet another pathway by which AIS can be introduced to new waters. While most of these organisms will die, some may be able to survive and become established, resulting in the degradation of aquatic resources.

## ***SECTION 2: EDUCATIONAL OUTREACH***

One component of Chelan PUD's Monitoring Plan will be to provide educational opportunities for the public about the risks involved with AIS. This will include distribution of educational materials as well as administration of boater self-surveys.

Section 5.6(2)(a) of the 401 Water Quality Certification issued by Ecology on April 4, 2006, requires the following:

*“Signage at boat launches and distribution of educational materials and boater questionnaires to voluntary participants at Rocky Reach Reservoir boat launch sites during the peak boating season (May 1 – October 30 each year) to increase boater awareness of dangers of spreading AIS, including the methods one can take to decrease the spread of AIS (eg clean the weeds off the boat and drain the live well before going to a new waterbody).”*

These educational tools are discussed in the following three sections.

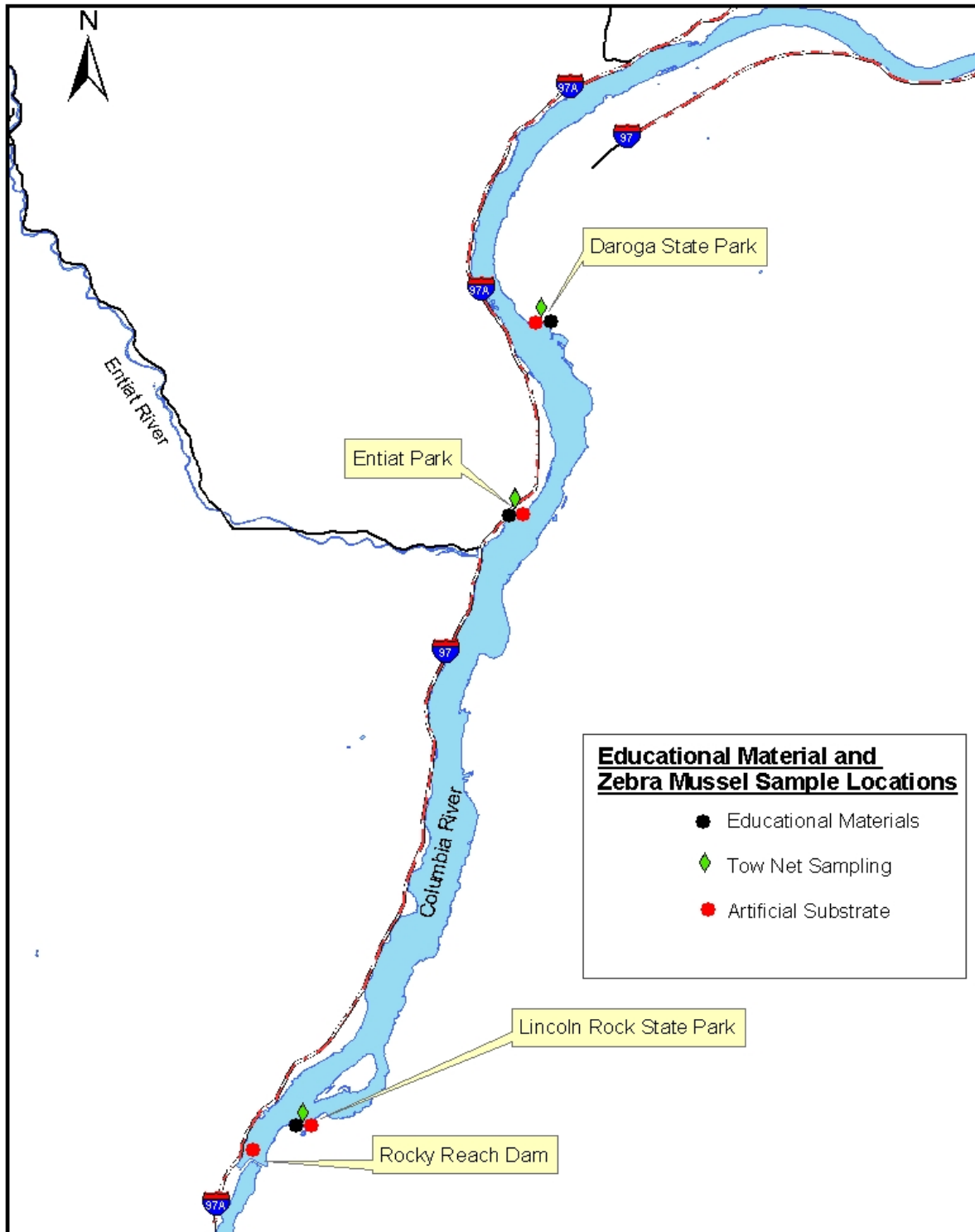
### **2.1 Educational Materials**

Chelan PUD will utilize existing kiosks and signage at boat launches within the Project to distribute educational material each year during the peak of the boating season (May 1–October 30). Potential boat launch sites include: Lincoln Rock and Daroga State Parks, Beebe Bridge Park, Chelan Falls Park, and Entiat Park (Figures 3 and 4). Any new boat launches developed in the future will also be considered for placement of educational signs or kiosks. Educational materials will consist of free pamphlets, identification cards, and signs. The goal of these educational materials is to increase public awareness of the dangers of spreading AIS, as well as how its spread can be reduced and/or prevented.

The pamphlets, identification cards, and boat launch signs used to educate the public will be obtained from WDFW and the U.S. Fish and Wildlife Service (USFWS) to keep the signage used in the Project consistent with the other AIS signs used throughout Washington State. Educational material may also be available to discourage dumping of unwanted pets through the following website: <http://habitattitude.net>. The educational material will clearly present ways to avoid the spread of AIS (e.g., by removing and disposing of the weeds off the boats and trailers, and draining the live wells prior to moving to another water body). Pamphlets that help educate fisherman on proper gear cleaning and live bait handling methods may also be placed at the boat launches identified above.

### **2.2 Voluntary Self-Survey**

Prepared self-surveys to boaters will be modeled after the survey forms created by the 100<sup>th</sup> Meridian Initiative (Appendix A) and will be stocked at those sites deemed feasible. The purpose of the survey will be explained on the form and the boaters will be asked to complete the form and place it in a return box located on site or return it via mail to Chelan PUD. This boater self-survey requests information from the boater including home residence; number of times the boat was launched last year; other lakes/river where the boat has been recently launched; the destination of the boat; if the boater cleans the boat, bait well, and fishing gear between each launch; storage methods for the boat, and if the boater is aware of the threat of AIS.



**Figure 2-1.** Proposed Locations of Potential Educational Materials and Zebra Mussel Sampling on the Lower Reach of the Rocky Reach Reservoir.

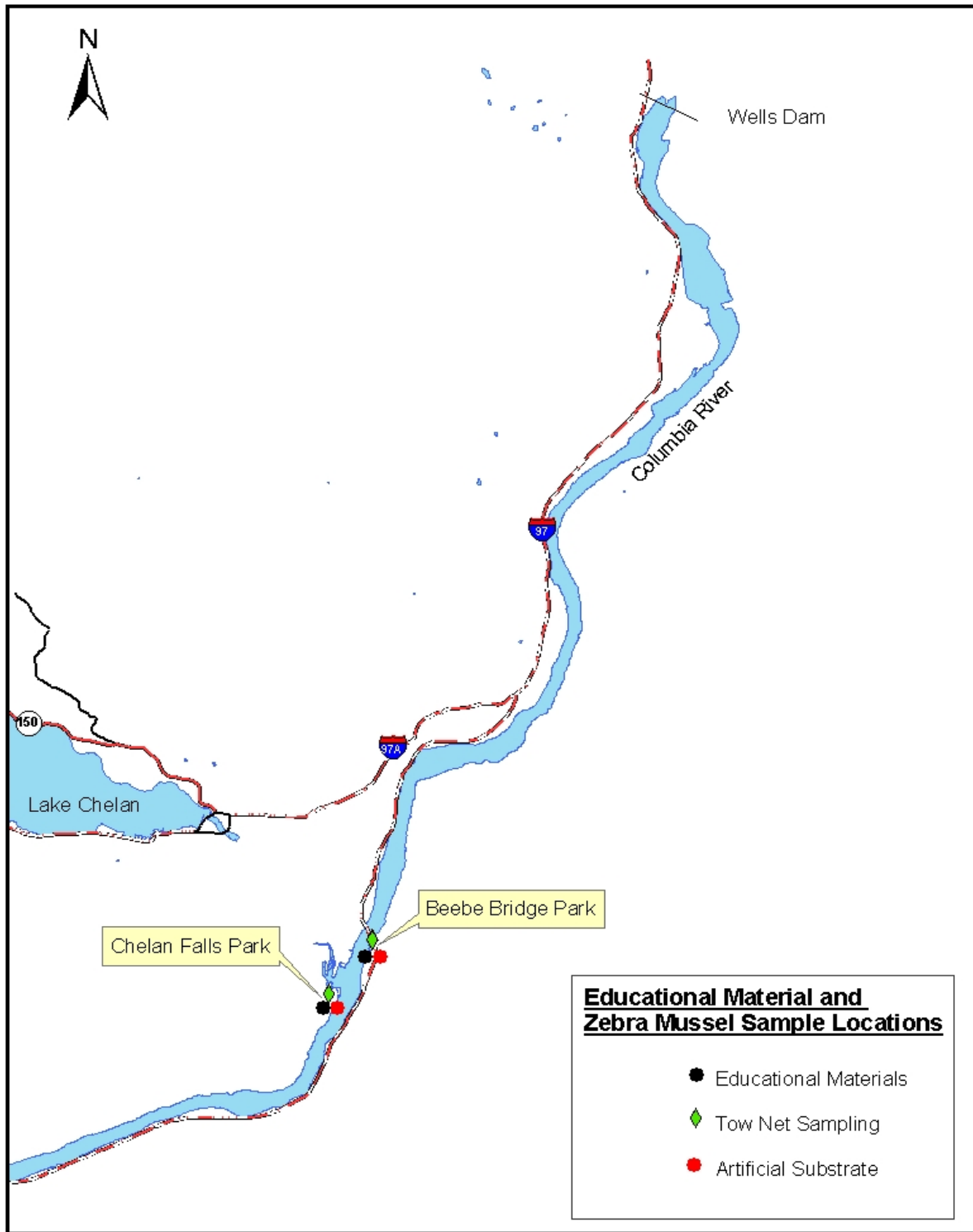


Figure 2-2. Proposed Locations of Potential Educational Materials and Zebra Mussel Sampling on the Upper Reach of the Rocky Reach Reservoir.

## **SECTION 3: AIS PLANT MONITORING**

Monitoring of both present and new AIS flora is an important component to AIS management. As part of the Monitoring Plan, Chelan PUD proposes to monitor the entire Columbia River corridor portion of the Project to the ordinary high water mark (OHWM) on the shoreline every other year and all Project boat launches annually for AIS plants. The boat launch monitoring and the Project wide monitoring would begin the first year following WDOE and FERC approval of this Monitoring Plan. Chelan PUD will monitor for all aquatic invasive plants listed on the Washington State Noxious Weed List as outlined in RCW 17.26.020(5)(c) (see also Table 1). The goal of the AIS plant monitoring component will be to identify newly introduced AIS plants, as well as to map and track the movement of newly found and/or existing AIS plants. Monitoring will also allow for determination of success of control/eradication efforts.

Although this Monitoring Plan focuses on aquatic invasive plant species, as part of the plant monitoring effort Chelan PUD will also monitor and map for existing and new terrestrial, wetland, and/or riparian zone plants that can be identified from the shoreline/boat launch monitoring efforts, as described below. Potential additional monitoring and/or control efforts will be coordinated through Chelan PUD's Wildlife and Parks departments.

**Table 3-1.** AIS Plants that will be Monitored for in the Columbia River as Part of the Rocky Reach Project.

| Common Name              | Genus/Species              | Submergent | Emergent | Existing | Potential Control                 |
|--------------------------|----------------------------|------------|----------|----------|-----------------------------------|
| Eurasian Watermilfoil    | Myriophyllum spicatum      | X          |          | X        | Biological, Physical <sup>1</sup> |
| Curly-leaf Pondweed      | Potamogeton crispus        | X          |          | X        | Chemical, Physical                |
| Hydrilla                 | Hydrilla verticillata      | X          |          |          | Chemical, Physical                |
| Variable-leaf Milfoil    | Myriophyllum heterophyllum | X          | X        |          | Chemical, Physical                |
| Brazilian Elodea         | Egeria densa               | X          |          |          | Chemical, Physical                |
| Parrot Feather           | Myriophyllum aquaticum     |            | X        |          | Chemical, Physical                |
| Floating Primrose-willow | Ludwigia peploides         |            | X        |          | Chemical, Physical                |
| Waterprimrose            | Ludwigia hexapetala        |            | X        |          | Chemical, Physical                |
| Fanwort                  | Cabomba caroliniana        | X          |          |          | Chemical, Physical                |
| Fragrant Water Lily      | Nymphaea odorata           | X          | X        |          | Chemical, Physical                |
| Yellow Floating Heart    | Nymphoides peltata         |            | X        |          | Chemical, Physical                |
| Flowering Rush           | Butomus umbellatus         |            | X        |          | Chemical, Physical                |

<sup>1</sup> Physical controls may include bottom barrier, harvesting, and/or hand pulling.  
Newly listed aquatic invasive plant species not listed here will be added to this table as needed during the annual updates to this plan.

### **3.1 Shoreline Monitoring**

Shoreline monitoring efforts would consist of visually identifying plants and inspecting for AIS from a boat while traveling slowly along each shoreline. In areas where macrophytes cannot be seen, a sampling rake will be used to pull up macrophytes for visual identification. Macrophytes will also be examined for animals (e.g. the New Zealand Mudsnail) that may be attached. Digital photographs will be taken and sent to WDFW and/or WDOE AIS personnel for identification assistance, as necessary. A map showing locations of all areas sampled and plants identified will be created using GPS data collected from the locations where macrophytes were sampled. Once a baseline map and GPS database is established, the same sites will be re-visited every two years between the months of July and September during the peak macrophyte density. This will also allow for determination of newly introduced AIS plant or animals that were not present during the previous sampling event and/or will allow for tracking the increase/decrease of existing plants.

### **3.2 Boat Launch Monitoring**

Monitoring for AIS plant species will also be done via visual surveys at each boat launch. The surveys would be conducted by boat by traveling approximately 50 meters waterward from the launch, or until visual



contact with the macrophytes is lost. Additionally, similar surveys will be conducted approximately 30 meters upstream and downstream of the launch to detect the presence of new AIS that may not have settled immediately at the launch. These macrophyte surveys will be done annually between the months of July and September when the annual macrophyte density is at its peak. Through these visual surveys, Chelan PUD will be able to monitor for new AIS that might have entered the Project through recreational boater use.

### **3.3 Control/Management**

Currently, the only known AIS plants established within the Project area are Eurasian water milfoil and curly-leaf pondweed. Potential control and management efforts are explained in more detail below. Note that terrestrial, wetland, and/or riparian zone AIS plants are currently monitored, managed, and controlled as part of other ongoing Chelan PUD efforts (e.g., parks maintenance, wildlife surveys, real estate surveys). Any newly identified AIS plants found during the monitoring efforts will be discussed with WDOE and WDFW, and potential control, management, and/or eradication efforts for that given species will be determined as necessary. These activities will then be included in the annual report.

#### ***3.3.1 Eurasian water milfoil***

Eurasian water milfoil is an invasive nonnative plant, and is considered to be one of the most undesirable AIS nuisance plants in North America because of its negative effects on such recreational activities as boating, swimming, and fishing (WDOE 2001). Like native aquatic milfoils, it has feather-like underwater leaves and emergent flower spikes. Eurasian water milfoil is often identified by leaf shape; however, due to its variability, chemical and DNA analysis may be needed to distinguish it from native milfoil species (WDOE 2001).

There are currently several techniques used in the western United States to manage Eurasian water milfoil, with some of the most feasible methods including mechanical harvesting, biological or herbicidal control, and physical control (e.g. bottom barriers). However, each of these methods has uncertainties related to their effectiveness, impacts to other aquatic species and habitat, and feasibility of use within the Project given the large scale of Eurasian water milfoil infestations. Therefore, Chelan PUD will focus its control/management of Eurasian water milfoil through use of education/public awareness activities (see Section 2) as well as monitoring (see Section 3) in an attempt to manage and limit the spread of Eurasian water milfoil throughout the Project. Adaptive management tools will also be used by Chelan PUD to modify its Eurasian water milfoil control/management methods, if needed, based on results of the voluntary boater self-surveys, monitoring efforts, and/or improvements in physical control methods.

If public feedback indicates a need for more aggressive control of milfoil beds is needed at Project boat launches, through adaptive management Chelan PUD will consider additional alternatives for control at the boat launches. These additional alternatives will be discussed within the annual report and with WDOE. Current possible alternatives includes the use of herbicides, but those (and any other new technologies), will need to be further evaluated based on monitoring results, potential impacts to other aquatic species, habitat, recreation, etc.

Additional information on annual reporting and adaptive management can be found within Sections 6 and 7 of this Monitoring Plan.

#### ***3.3.2 Curly Leaf Pondweed***

Curly-leaf pondweed is a submerged nonnative plant that is widespread in temperate North America and is found throughout Washington. It has distinctly wavy-edged, crispy olive-green to reddish brown leaves that attach in an alternate pattern to the stem. Curly-leaf pondweed produces small flowers that are arranged on dense terminal spikes that rise a few inches above the surface of the water. In the spring, the plant produces dormant vegetative propagules known as turions.

There are currently several techniques used to manage curly-leaf pondweed, with some of the most feasible methods including mechanical harvesting and herbicidal control. However, each of these methods has uncertainties related to their effectiveness, impacts to other aquatic species and habitat, and feasibility of use within the Project. Therefore, Chelan PUD will focus its control/management of curly-leaf pondweed through use of education/public awareness activities (see Section 2) as well as monitoring (see Section 3) in an attempt to manage and limit the spread of curly-leaf pondweed throughout the Project. Adaptive management tools will also be used by Chelan PUD to modify its control/management methods, if needed, based on results of the voluntary boater self-surveys, monitoring efforts, and/or improvements in control methods.

## SECTION 4: AIS ANIMAL MONITORING

Monitoring for AIS animals is another component of this Monitoring Plan. Aquatic Invasive Species fish will be monitored under a separate Resident Fish Monitoring Program (RFMP) conducted as detailed in Chapter 6 of the Comprehensive Plan, Attachment B to the Settlement Agreement, dated February 3, 2006 (included in the License). Under this Monitoring Plan, Chelan PUD will monitor for zebra mussels, quagga mussels, New Zealand mudsnail, and other AIS animals. The sections below summarize AIS animal monitoring efforts.

### 4.1 Fish

The Project is currently residence to 12 introduced species of fish (Table 2). Chelan PUD will be able to monitor the abundance and spread of these 12 species through the RFMP that will consist of a Project-wide evaluation of resident fish species. Frequency of these comprehensive evaluations will be determined in coordination with the Rocky Reach Fish Forum (RRFF).

In an effort to provide WDFW with information regarding possible new AIS fish introductions within the Columbia River Basin, Chelan PUD will coordinate its RFMP, as well as its other fish management/monitoring programs, so that suspected identification of new AIS fish can be reported to WDFW AIS personnel. For example, any bycatch of new AIS fish species during Chelan PUD's northern Pike minnow removal program, fish salvage efforts (e.g. during fish-ladder outages), etc. will be reported to WDFW as soon as Chelan PUD's AIS coordinator is notified by Chelan PUD biologists. WDFW will provide an updated list of AIS fish that have potential to be introduced into the Columbia River Basin, and Chelan PUD will provide this list to its biologists working on the various Chelan PUD fish programs. At a minimum, any new AIS fish identified within the Project will be reported to WDFW on a quarterly basis. If no new AIS fish species are identified, that will be included in the annual Monitoring Report.

**Table 4-1. Introduced Fish Species Found in the Rocky Reach Project.**

| Family        | Common Name     | Scientific Name        |
|---------------|-----------------|------------------------|
| Centrarchidae | Black crappie   | Pomoxis nigromaculatus |
|               | Bluegill        | Lepomis macrochirus    |
|               | Largemouth bass | Micropterus salmoides  |
|               | Pumpkinseed     | Lepomis gibbosus       |
|               | Smallmouth bass | Micropterus dolomieu   |
| Cyprinidae    | Common carp     | Cyprinus carpio        |
|               | Tench           | Tinca tinca            |
| Ictaluridae   | Black bullhead  | Ameiurus melas         |
|               | Channel catfish | Ictalurus punctatus    |
| Percidae      | Walleye         | Sander vitreus         |
|               | Yellow perch    | Perca flavescens       |
| Salmonidae    | Brown trout     | Salmo trutta           |

### 4.2 Zebra and Quagga Mussels

Zebra mussels and quagga mussels are prolific invaders that cost the United States hundreds of millions of dollars each year (Univ. of Minnesota Sea Grant Program 2004). These small mussels indigenous to Eurasia can clog water intakes and damage equipment by attaching to boat motors and hard surfaces. They have the ability to damage ecosystems by harming fisheries, smothering native mussels and crayfish, and littering beaches with their sharp shells (Univ. of Minnesota Sea Grant Program 2004).

Zebra mussels occur in many Eastern United States waters and spread primarily by attaching to boat hulls, aquatic plants, nets, fishing equipment, or through water contaminated with their larvae (Univ. of Minnesota Sea Grant Program 2004). Adult zebra mussels can survive out of water for up to 30 days under certain conditions.

#### ***4.2.1 Horizontal Zooplankton Tow Net Sampling***

Chelan PUD began conducting horizontal zooplankton tow net sampling for zebra and quagga mussel veligers downstream of Rocky Reach and Rock Island dams in the early 2000s in cooperation with WDFW in an early warning zebra/quagga mussel monitoring program. This effort will be extended to the Rocky Reach Project as part of this Monitoring Plan. The horizontal tow samples will be collected at three locations throughout the Project (Figures 3 and 4). Samples will be taken at Lincoln Rock and Daroga State Parks and Chelan Falls Park. The samples will be taken two to four times annually between June and September when conditions are suitable for mussel spawning and larval development.

Sampling methods include use of a Wisconsin plankton net (363 $\mu$  mesh net) that is drifted for a distance of 40-100 ft at a depth of approximately 20 ft for each location. The plankton net is thoroughly rinsed and all sample material transferred into a 250ml Teflon bottle and preserved immediately with 70 percent isopropyl alcohol. A label is affixed to the sample bottle and appropriately filled out. The sampling procedures follow protocols developed by WDFW (Pamala Meacham, WDFW, pers. com.). The samples are then cataloged and shipped to a certified laboratory for analysis and determination of veliger presence or absence. Chelan PUD will implement response actions as described in Section 5 if zebra or quagga mussels are detected or suspected.

#### ***4.2.2 Artificial Substrate Monitoring***

In an effort to monitor for zebra and quagga mussels near areas with high boat traffic, Chelan PUD will deploy artificial substrates at Project boat launch docks and or/buoys. Boat launches anticipated for monitoring include Lincoln Rock and Daroga State Parks, Beebe Bridge Park, and Chelan Falls Park, and Entiat Park (Figures 3 and 4). Substrate placement at each site will be dependent upon a secure location on which to mount the substrate; therefore it is possible that not all proposed sites will be used for substrate monitoring. Chelan PUD will follow the artificial substrate monitoring protocols as provided by WDFW. One substrate will be deployed at each site from a boat dock or buoy. The substrates will be kept at least one meter above the bottom and will be examined monthly from June through September. Chelan PUD will implement response actions as described in Section 5 if zebra or quagga mussels are detected or suspected.

#### ***4.2.3 Substrate Monitoring at Rocky Reach Dam***

As part of this Monitoring Plan, Chelan PUD will also begin monitoring for presence of adult zebra and quagga mussels that may have become attached on fishways, intake screens, cooling units, and other equipment at Rocky Reach Dam. Equipment that is regularly taken out of operation for maintenance will be inspected by Chelan PUD staff. Chelan PUD will implement response actions as described in Section 5 if zebra or quagga mussels are detected or suspected.

Results of this effort, including type of equipment inspected, frequency, and species found will be included in the annual AIS report (see Section 6).

### ***4.3 New Zealand Mudsnail***

The New Zealand mudsnail (*Potamopyrus antipodarum*) has become well established in many river drainages throughout the western United States and is quickly spreading to new locations (Richards et al. 2004). The New Zealand mudsnail is a parthenogenic live-bearing, prosobranch snail with high reproductive potential and is spread to new waters via contaminated fishing equipment (Winterbourn 1970, Richards et al. 2004).

#### ***4.3.1 Monitoring***

Merritt and Cummings (1996) list numerous benthic invertebrate sampling methods that have been developed and are widely used for different purposes and habitats. These include the Surber and Hess sampler, kick-nets, Ponar grabs, snorkeling, SCUBA, hand picking, suction dredges, and colonization samplers or traps.

Chelan PUD will monitor for New Zealand mudsnails while conducting the annual boat launch and biennial shoreline macrophyte monitoring studies (see Section 3). Additionally, the artificial substrates to be installed for zebra and quagga mussel monitoring may also serve as colonization samplers for New Zealand mudsnails.

## **SECTION 5: RESPONSE AND COORDINATION**

Early detection and rapid response to an infestation of AIS is essential to the control and potential containment of AIS. Through this Monitoring Plan, Chelan PUD will implement monitoring programs that will help detect new AIS infestations as soon as possible. In the event of positive identification of new AIS within the Project area, Chelan PUD will conduct the following response activities:

- Immediate notification to WDOE (for plants) or WDFW (for animals) of positive or suspected AIS species identified during monitoring and/or boat inspections. Digital photographs will be taken and sent to WDOE or WDFW for assistance in identification, as needed. Table 3 provides contact information for AIS personal to be contracted in event of new AIS identification.
- If the AIS is a zebra or quagga mussel, Chelan PUD will also notify upstream and downstream dam operators (Douglas PUD and Grant PUD) and the Columbia River Basin Team. Chelan PUD will then assist the Columbia River Basin Team in rapid response implementation as applicable to the Project. Table 3 provides contact information for AIS personnel to be contacted in the event of new AIS identifications.
- Chelan PUD will assist in the coordination of agency site visits as necessary to assist in confirming the presence and extent of AIS infestation and determination of immediate or long-term control/eradication needs.

**Table 5-1.** Contact List for AIS Response.

| <b>Contact</b> | <b>Name</b>        | <b>Phone Number</b>      | <b>E-Mail Address</b>     |
|----------------|--------------------|--------------------------|---------------------------|
| WDOE           | Kathy Hamel        | 360-407-6562             | kahm461@ecy.wa.gov        |
|                | Jenifer Parsons    | 509-457-7136             | jenp461@ecy.wa.gov        |
|                | Pat Irle           | 509-454-7864             | pir1461@ecy.wa.gov        |
| WDFW           | Allen Pleus        | 360-902-2724             | allen.pleaus@dfw.wa.gov   |
|                | Pam Meacham        | 360-902-2741             | pamala.meacham@dfw.wa.gov |
|                | Sgt. Eric Anderson | 360-640-0492             | eric.anderson@dfw.wa.gov  |
| Douglas PUD    | Josh Murauskas     | 509-881-2323             | joshm@dcpud.org           |
| Grant PUD      | Ross Hendrick      | 509-754-5088<br>ext 2468 | rhendr1@gcpud.org         |

## ***SECTION 6: ADAPTIVE MANAGEMENT***

Adaptive management will be a key component to implementation of this Monitoring Plan over the entire term of the Project's 43-year operating license. The 401 Certification incorporates, by reference, Adaptive Management as defined in the Settlement Agreement and provides the generalized meaning of adaptive management as it relates to meeting requirements within the 401 Certification. As part of this Monitoring Plan, Chelan PUD will conduct the following activities to assure adaptive management is incorporated into this Monitoring Plan:

- By February 19 of each year, provide to WDOE a report summarizing the previous year's AIS activities and any needed changes to the Monitoring Plan that will be implemented during the up-coming year, as described in section 5.6.2(c) of the 401 Certification.
- Based on the results of the previous year's results or new AIS science, this Monitoring Plan may be updated to reflect updated implementation schedules, monitoring methods, educational methods, new AIS threats, and/or new AIS that have been identified through previous year's monitoring efforts and potential control/eradication options.
- Coordinate with WDOE and the Rocky Reach Fish Forum any needed changes to AIS education, monitoring, and/or control methods based on the results from the previous year, new technologies, new AIS threats and/or introductions, new AIS pathways, etc.

## ***SECTION 7: REPORTING***

By February 19 of each year, Chelan PUD will submit an annual report to WDOE which will include a summary of monitoring and educational activities conducted each year. Chelan PUD will work in coordination with WDOE and the RRF to stay current of potential changes involving future AIS management and monitoring in the Project.



## **SECTION 8: IMPLEMENTATION SCHEDULE**

Table 4 provides the proposed implementation schedule related to tasks to be completed under the monitoring and management of AIS in the Project. This table included tasks already being completed as well as new tasks proposed in this Monitoring Plan.

**Table 8-1. Implementation Schedule**

| Task  | Action   | Schedule   |
|---|--|--|
| Place signage, educational materials, and self-surveys at Project boat launches | Maintain signs at boat launches, update pamphlets, and replenish surveys as needed | Prior to May 1 of each year following WDOE and FERC approval of AIS Plan   |
| Monitor for zebra and quagga mussels  | Monitor for the presence of veligers June - September                              | Annually June-Sept   |
| Monitor for new/spreading aquatic invasive plants and animals                   | Monitor Project boat launches annually and entire shoreline biennially             | Boat launches: annually between July and September. Shorelines: biennially |
| Stay current on rapid response methods and technology                           | Monitor developing response methods and technologies.                              | As available   |
| Report to WDOE and RRF on AIS program   | Summarize monitoring efforts   | Annually by February 19.   |
| Participate in regional forums  | Attend in person or via conference-call meetings of regional forums addressing AIS | TBD  |

## ***SECTION 9: CONCLUSIONS***

This Monitoring Plan provides the education, monitoring, and response actions planned by Chelan PUD within the Project area. The goal of this Monitoring Plan is to help reduce potential new AIS introductions, while also attempting to respond to new AIS identifications through control, management, and eradications. The actions described in this Monitoring Plan were developed to meet the conditions of the 401 Certification for the Project. This Monitoring Plan will be updated annually to reflect any changes in implementation schedules, new or improved technologies, or new AIS threats.

## *LITERATURE CITED*

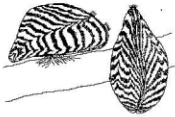
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***APPENDIX A: VOLUNTEER BOATER SURVEY***

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LOCATION \_\_\_\_\_ STATE \_\_\_\_\_ DATE \_\_\_\_\_



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

The Zebra Mussel

The **100<sup>th</sup> 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 100<sup>th</sup> 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)**

|  |                   |                 |
|--|-------------------|-----------------|
| <b>PART ONE: Where are you from?</b>   | Home State: _____ | Zip Code: _____ |
| <b>Type of Boat:</b> <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.  |        |         |       |

|  |        |         |       |
|--|--------|---------|-------|
| <b>PART TWO: Where are you going?</b> 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: _____   |
| <b>Any Comments:</b>  |

***APPENDIX B: CONSULTATION RECORD***

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## **B.1 Comment Letters Received**

### **Email with Attachment From Patricia Irlé (DOE)**

Received January 22, 2010

#### Comments on Draft Aquatic Invasive Species Monitoring and Control Plan for Rocky Reach Hydroelectric Project License

By: Jenifer Parsons, aquatic plant specialist, WDOE

##### Section 1.1

An additional pathway of introduction to consider is intentional planting of ornamental pond plants (particularly by landowners with waterfront property) and dumping of unwanted pets (e.g. fish, frogs, snakes) or ornamental plants.

##### Section 2.1

Educational material may also be available to discourage dumping of unwanted pets through the following website <http://habitattitude.net/>

##### Section 2.2

In addition to voluntary self-surveys it would be good to set up boat inspection and washing stations on high use weekends at the various boat launches. The boating public would be more likely to respond to a person, and they would have the opportunity to have their questions answered directly. This is included in the AIS plan currently in draft form by Grant PUD for the reservoirs farther downstream.

##### Table 1

- Add *Butomus umbellatus* (flowering rush) – as it has a submersed growth form though generally it is thought of as an emergent plant – It often grows at depths of 10 – 12 ft
- *Egeria* is submersed
- Parrotfeather is (sprawling) emergent
- Add *Ludwigia hexapetala* – very similar to *Ludwigia peploides* which is on the list
- Add *Nymphoides peltata* – a floating leaved plant
- (None of these are currently known from the project area)
- Potential control methods – the only species with known biological control agents is Eurasian watermilfoil, chemical control and physical controls (bottom barrier, harvesting, hand pulling) may be an option for all of them

##### Section 3.1

So, in monitoring year subsequent to the first, would you only visit areas known to provide aquatic plant habitat?

##### Section 3.2

Suggest also running transects a set distance above and below the launch to detect presence of new AIS that may not have settled immediately at the launch.

##### Section 3.3.1

Would help to explain what level of milfoil growth would trigger more aggressive control measures at boat launches. Milfoil reaching the surface ? forming mats? Covering some percentage of the water? These areas are particularly critical to control since they would be the main source of fragments to get caught on equipment and carried to other waterbodies.

Also monitor curly leaf pondweed and if it becomes more of an issue be prepared to implement some control over it also.

#### Section 4.3

Suggest adding some monitoring specific to New Zealand mudsnails, rather than just looking for them on macrophytes. They also use rocks, leaf litter and other substrates as habitat. Suggestions for monitoring methods can be found in the National New Zealand mudsnail management plan at <http://www.anstaskforce.gov/control.php>

#### **Email from WDFW to Patricia Irle (DOE), forwarded to Licensee**

Received January 27, 2010

FYI

**From:** Pleus, Allen E (DFW)  
**Sent:** Tuesday, January 26, 2010 11:43 AM  
**To:** Parsons, Jenifer (ECY); Irle, Pat (ECY); Eldred, Duane R (DFW)  
**Cc:** Verhey, Patrick M (DFW)  
**Subject:** RE: Rocky Reach Draft Aquatic Invasive Species Monitoring and Control Plan

My apologies for not being able to contribute to this plan due to other priorities. Thank you for keeping me in the loop and I hope to participate in future adaptive management of the plan as necessary.

Allen Pleus  
WDFW AIS Coordinator  
(360) 902-2724 office  
(360)-918-3868 cell  
Allen. [Pleus@dfw.wa.gov](mailto:Pleus@dfw.wa.gov)



**B.2 Response to Comments**

| <b>Section, Paragraph</b> | <b>Agency Comment</b>   | <b>Chelan PUD Response</b>   |
|---------------------------|---|--|
| Section 1.1               | An additional pathway of introduction to consider is intentional planting of ornamental pond plants (particularly by landowners with waterfront property) and dumping of unwanted pets (e.g. fish, frogs, snakes) or ornamental plants.   | Language added in response to comment.   |
| Section 2.1               | Educational material may also be available to discourage dumping of unwanted pets through the following website: <a href="http://habitatattitude.net/">http://habitatattitude.net/</a>  | Language added in response to comment.   |
| Section 2.2               | In addition to voluntary self-surveys it would be good to set up a boat inspection and washing stations on high use weekends at the various boat launches. The boating public would be more likely to respond to a person, and they would have the opportunity to have their questions answered directly. This is included in the AIS plan currently in draft form by Grant PUD for the reservoirs farther downstream.  | The AIS addresses implementation of all requirements of Rocky Reach License Order Article 401 and Section 5.6(2) of 401 Water Quality Certification.<br>Effectiveness of boat inspections and washing stations need to be further discussed and evaluated. |
| Table 1                   | Various revisions to the table.   | Suggested revisions made.  |
| Section 3.1               | So, in monitoring years subsequent to the first, would you only visit areas known to provide aquatic plant habitat?   | That is our intention at this time, but this may be revised in subsequent years and will be addressed accordingly in annual reports.   |
| Section 3.2               | Suggest also running transects a set distance above and below the launch to detect presence of new AIS that may not have settled immediately at the launch.   | Language added in response to comment.   |
| Section 3.3.1             | Would help to explain what level of milfoil growth would trigger more aggressive control measures at boat launches. Milfoil reaching the surface? Forming mats? Covering some percentage of the water? These areas are particularly critical to control since they would be the main source of fragments to get caught and carried to other waterbodies.<br>Also monitor curly leaf pondweed and if it becomes more of an issue be prepared to implement some control over it also. | Language added in response to comment.   |
| Section 4.3               | Suggest adding some monitoring specific to New Zealand mudsnails, rather than just looking for them on macrophytes. They also use rocks, leaf litter and other substrates as habitat. Suggestions for monitoring methods can be found in the National New Zealand mudsnail management plan at <a href="http://www.anstaskforce.gov/control.php">http://www.anstaskforce.gov/control.php</a>   | Language added in response to comment.   |

