AVISTA CORPORATION

COEUR D'ALENE LAKE AQUATIC WEED MANAGEMENT PLAN FOR NON-TRIBAL WATERS

SUMMARY REPORT

ARTICLE 410

SPOKANE RIVER HYDROELECTRIC PROJECT

FERC PROJECT NO. 2545

Prepared By:

Avista Corporation

February 27, 2012

February 28, 2012

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St. N.E.
Washington, DC 20426

Subject: **Spokane River Project License, FERC Project No. 2545, Article 410, Submittal of the 2011 Coeur d'Alene Lake Aquatic Weed Management for Non-Tribal Waters Summary Report**

Dear Secretary Bose:

In accordance with the Federal Energy Regulatory Commission's (FERC) June 18, 2009 Spokane River Hydroelectric Project (No. 2545) License Article 410, Avista developed and submitted a Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters (Plan) for FERC's approval. FERC approved the Plan on January 19, 2011 allowing Avista to begin implementation.

The Plan requires Avista to submit an annual Coeur d'Alene Lake Aquatic Weed Management for Non-Tribal Waters Summary Report to FERC for approval after consulting with the Idaho Department of Environmental Quality (IDEQ), Idaho State Department of Agriculture (ISDA), Kootenai County Noxious Weed Control Board (KCNWCB), and the Coeur d'Alene Tribe. Copies of the correspondence with the agencies and Tribe are included in Appendix E of the Summary Report. Please note that IDEQ was the only agency that provided comments, which were included in the Summary Report as appropriate.

If you have any questions regarding this filing, please feel free to contact me at (509) 495-4998 or David Armes at (509) 495-2796.

Sincerely,

for Elvin "Speed" Fitzhugh
Spokane River License Manager

Enclosure

cc: Glen Rothrock, IDEQ
Tom Woolf, ISDA
Linda Ely, KCNWCB
Dave Lamb, Coeur d'Alene Tribe

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1.0 INTRODUCTION

The purpose of the Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters (Plan) is to control the spread and reduce the distribution of aquatic noxious weeds within non-tribal Project waters of Coeur d'Alene Lake. To achieve this purpose, Avista cooperates with and supports entities that have existing aquatic weed management programs on Coeur d'Alene Lake. As such, this report summarizes management tasks completed by Avista as well as the cooperating parties (discussed in Section 2.0).

During 2011 Avista:

- Coordinated efforts with the cooperating parties identified in Section 2.0;
- Partnered with the Idaho Department of Environmental Quality (IDEQ) to survey 6 bays for milfoil;
- Partnered with Kootenai County to survey the Spokane River upstream of the Post Dam for aquatic weeds;
- Completed a milfoil habitat mapping project for Coeur d'Alene Lake;
- Coordinated with the Idaho State Department of Agriculture (ISDA) to obtain the 2011 Coeur d'Alene Lake survey results;
- Completed a Coeur d'Alene Lake milfoil brochure;
- Partnered with Kootenai County to distribute educational/outreach materials;
- Included the results of Kootenai County's 2011 milfoil treatments in Harrison Slough; and
- Completed milfoil management in Coeur d'Alene Lake Tribal waters.

1.1 Background

On June 18, 2009, the Federal Energy Regulatory Commission (FERC) issued a new license for Avista Corporation's (Avista) Spokane River Hydroelectric Project, FERC Project No. 2545 for a 50-year license term. The new FERC License (License) became effective on June 1, 2009 and includes operation of five Hydroelectric Developments (HEDs) on the Spokane River; four in the state of Washington (Upper Falls, Monroe Street, Nine Mile, and Long Lake HEDs) and one in Idaho (Post Falls HED). Article 410 of the License requires the development of a Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters. On January 19, 2011, FERC issued an Order Modifying and Approving the Coeur d'Alene Aquatic Weed Management Plan For Non-Tribal Waters, Pursuant to Article 410 (FERC Order 2545-129). The Plan is specific to Avista's Post Falls HED, which is located on the Spokane River approximately nine miles downstream from the outlet of Coeur d'Alene Lake.

1.2 License Requirements

Article 410 Coeur d'Alene Lake Aquatic Weed Management for Non-tribal Waters of the License states that *within one year of license issuance, the licensee shall file, for Commission approval, a Coeur d'Alene Lake aquatic weed management plan for the purpose of providing education, monitoring, and control of aquatic noxious weeds in the Coeur d'Alene Lake basin on non-tribal waters. The plan shall include, but not necessarily be limited to:*

1. *a provision to establish or expand educational programs with respect to noxious aquatic weeds in non-tribal waters affected by the project;*
2. *a provision to annually monitor the distribution of noxious aquatic weeds within non-tribal waters affected by the project; and*
3. *management strategies to help control noxious aquatic weeds as they are identified within non-tribal waters affected by the project.*

In addition to an implementation schedule, the licensee shall include with the plan, documentation of consultation with the Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service; copies of comments and recommendations on the completed plan after it has been prepared and provided to the consulted entities; and specific descriptions of how the consulted entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the consulted entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan and associated schedule shall not begin until the plan and schedule are approved by the Commission. Upon Commission approval, the licensee shall implement the plan and schedule, including any changes required by the Commission.

1.3 Coeur d'Alene Lake Aquatic Weed Management Plan

This Coeur d'Alene Lake Aquatic Weed Management Plan (Plan) provides for the management of aquatic noxious weeds within the Post Falls HED Project boundary, excluding the Coeur d'Alene Indian Reservation (Reservation) (Figure 1). The Plan includes the following elements:

1. Provisions to establish or expand aquatic noxious weed educational programs;
2. A framework for annual monitoring to determine the distribution of aquatic noxious weeds; and
3. Management strategies for the control of aquatic noxious weeds.

The Plan also identifies potential cooperating parties (discussed in Section 2.0 Coordination) currently involved in the management of aquatic noxious weeds within the Project boundary, and a schedule within which Avista will work with the cooperating parties to implement measures described in the Plan. The purpose of the coordination is to cooperate with and support entities that implement aquatic weed management programs within the Project boundary.

The littoral habitats have been surveyed for aquatic noxious weeds since 2006, with most habitats susceptible to weed infestation having been surveyed more than once. Eurasian watermilfoil (*Myriophyllum spicatum*) and a hybrid of Eurasian watermilfoil and northern watermilfoil (*M. sibiricum*) are the only aquatic noxious weeds that have been identified in the area addressed by this Plan. Infestations of these species have been found in Harrison Slough, along the shoreline near Harrison, within the navigable waters of Heyburn State Park, and within

three chain lakes associated with the Coeur d'Alene River (Cave, Medicine, and Black lakes; CDAT 2006, 2008, 2009, 2010; IECWMA 2007). In addition, the Coeur d'Alene Tribe (Tribe) (2008, 2009, 2010) reports infestations of watermilfoil within the St. Joe and St. Maries rivers upstream of the Coeur d'Alene Reservation boundary (New locations of milfoil were identified in 2011 and are discussed in Section 3.0).

2.0 COORDINATION

The Plan is designed to allow Avista to cooperate with and support entities that have existing aquatic weed management programs on Coeur d'Alene Lake. Entities that have been identified as potential cooperating parties include, but are not limited to: IDEQ; Kootenai County Noxious Weed Control Board; ISDA and the Tribe (cooperating parties). Avista met with the cooperating parties on March 21, 2011 and on May 20, 2011. The purpose of these meetings was to coordinate activities for the 2011 field season (Meeting minutes are located in Appendix A). The meetings resulted in the 2011 Combined Work Plan Activities outlined in Table 1.

Table 1. 2011 Combined Work Plan Activities

MONITORING
Avista provided funding to IDEQ for the purchase of SCUBA equipment. SCUBA equipment was utilized by IDEQ to survey six bays in Coeur d'Alene Lake. A total of 24 bays will be surveyed over the next four years. IDEQ and Avista shall coordinate to insure the IDEQ surveys adhere to the Spokane River License requirements and follow survey protocol procedures established by ISDA. IDEQ shall provide an annual summary report to Avista.
Avista provided funding to Kootenai County to complete an aquatic weed survey on the Spokane River between Coeur d'Alene Lake and the Post Falls Dams. Kootenai County provided Avista with an summary report.
Avista coordinated with Kootenai County, ISDA, IDEQ and the Tribe to identify and map suitable habitat for milfoil. Suitable habitat was partitioned into high, moderate and low survey priority categories based on susceptibility to infestation.
EDUCATION/OUTREACH
Avista participated in the North Idaho Fair as a partner with both Kootenai County and IDEQ providing "give-aways," brochures and merchandise as needed and within budget.
Avista coordinated and reviewed public boat launches to confirm current signage is available and viewable regarding aquatic weeds.
MANAGEMENT/TREATMENT
Herbicide treatment of Cave/Medicine Lakes by Kootenai County (later changed to Harrison Slough)

3.0 2011 MONITORING

Avista coordinated with the cooperating parties (discussed in Section 2.0 Coordination) to identify and map suitable habitat for milfoil within Coeur d'Alene Lake. In general, habitat suitable for milfoil includes unshaded waters with a depth less than 30 feet and muck, clay or silt substrates (Prather et al. 2003). Suitable habitat was identified by high, moderate, and low survey priority categories based on susceptibility to infestation. Categorization of susceptibility is founded on proximity to existing infestations, proximity to public boat launches, prevailing currents, and recreational use patterns. Areas where infestations are known to exist were classified as high priority suitable habitat. Monitoring will occur annually in the following pattern: high priority suitable habitats will be surveyed a minimum of once per three-year period, moderate priority suitable habitats will be surveyed a minimum of once per four-year period and low priority suitable habitats will be surveyed a minimum of once per five-year period.

Avista supported and coordinated the IDEQ diver surveys (Section 3.1), Kootenai County Noxious Weed Control Board surveys on the Spokane River above the Post Falls dams (Section 3.2) and completed milfoil habitat surveys for Coeur d'Alene Lake (Section 3.3). Additionally, Avista obtained results of ISDA's 2011 surveys of Coeur d'Alene Lake (Section 3.4) and the milfoil control efforts on Coeur d'Alene Lake Tribal waters (Section 6.0).

3.1 2011 IDEQ Surveys

Avista provided funding to IDEQ for the purchase of SCUBA equipment that will be utilized to survey 6 bays in Coeur d'Alene Lake annually. A total of 24 bays will be surveyed over the next 4 years. IDEQ and Avista shall coordinate efforts to insure the IDEQ surveys adhere to the Spokane River License milfoil survey requirements and follow survey protocol procedures established by ISDA. IDEQ shall provide an annual summary report to Avista. Below is a summary provided by IDEQ of the work completed in 2011.

IDEQ surveyed six bays (Sun-up, Windy, Sixteen to One, Cave, Aberdeen Lodge, and Powderhorn) using point intercept, transect sampling and underwater video methods. The aforementioned bays and the shoreline from the mouth of the Coeur d'Alene River to Bell Bay were sampled using the point intercept (grid) method on July 5-7, 18, 20, and 21. The grid sampling covered numerous points within shallow water areas that allowed for the identification of aquatic plant communities and followed the established rake toss techniques. Site selection of points was generated using Hawths Tools, an ArsGIS extension. Spacing between points was 30-75 meters, and points were constrained to depths of less than 30 feet. Latitude and longitude were imported into a handheld GPS unit, and sites were located using the waypoint function. Species and genus groups were identified referencing three field manuals for aquatic plants of North America and Washington State (Borman et al., 1997; DiTomaso and Healy, 2003; Washington State Department of Ecology, 2001).

Transect sampling by SCUBA was conducted on July 25 and 26, August 2 and 3, and September 6, 8, and15. The sampling was a modification of the "line intercept" method as the samples in this study were collected at 3-foot depth increments from 3 to 21 feet (APHA, 1995; Tribe, 2006). Two transects were collected in each bay. Using a Humminbird™ depth finder, sampling locations were approximated and marked with a small anchor secured to a numbered buoy and

numbered sampling bag. Samples were collected using an 18" x 18" quadrat (0.21 m^2): a fixed corner, three-sided frame constructed from PVC pipe. At each sampling location, the quadrat was placed on the lake bottom and any plants contained within the quadrat were pulled from the substrate and placed in a numbered mesh bag.

To gain a better qualitative understanding of the macrophyte community structure, one diver was equipped with a JVC HD Everio underwater video camera (Model GZ-HD320). Once the transect was in place, the diver videoed the length of the transect before the other divers collected samples. This activity qualitatively illustrated the diversity and density of submerged macrophytes.

No milfoil plants were encountered during the point intercept method. Milfoil was observed and collected by SCUBA and underwater video (Figure 2). Part of a plant was found in a quadrat sample collected from Aberdeen Lodge Bay. It was unclear whether this plant was rooted or a floating fragment that was entangled in the sample as the crew returned to the bay later in the season (September) and didn't find any plants growing. One rooted milfoil plant was collected during the transect sampling in Sixteen to One Bay, however, no other plants were seen when the crew returned in September. In Windy Bay, milfoil was collected in small amounts within three quadrats, however large patches were visually encountered during the underwater video survey. It is estimated that these patches covered 300-500 square feet. Figure 2 identifies locations of milfoil identified during the 2011 Aquatic Vegetation Survey.

3.2 2011 Kootenai County Spokane River Aquatic Plant Surveys

Avista partnered with Kootenai County to complete the aquatic weed survey on the Spokane River between Lake Coeur d'Alene and the Post Falls HED. Kootenai County contracted with Lakeland Restoration to compete the survey. The survey method, maps and results can be found in the Final Report for the Spokane River Aquatic Plant Survey (Appendix B). Milfoil was not identified in the Spokane River portion of the survey.

3.3 2011 Milfoil Habitat Mapping

Avista contracted with AquaTechnex to complete a milfoil habitat mapping project (discussed in Section 3.0). The purpose of the mapping effort was to develop accurate habitat maps that will be used in future aquatic noxious weed survey efforts as required by the Plan. The primary considerations in classifying regions of the lake as high, moderate or low priority were: current aquatic plant growth, proximity to public access sites, suitable water depth to support aquatic plant growth and substrate conditions suitable for aquatic plant propagation.

Bathymetry data was used to define areas of Lake Coeur d'Alene shallow enough to support aquatic plant growth. While aquatic plants can grow to depths of 30 feet, that generally does not happen in most lake systems. Water clarity limits light penetration necessary to support aquatic plant photosynthesis and growth. Water clarity is highly variable from lake to lake. Lakes that support algae blooms or with turbidity issues will generally not have aquatic plant life surviving much deeper than 6-10 feet. Extremely clear water bodies may see aquatic vascular plant growth living to depth of 20-30 feet. Aquatic vascular plants even in extremely clear water bodies are also limited by pressure with depth and generally do not survive much below 28 feet.

After analyzing aquatic plant communities in the lake and reviewing the bathymetry data available to create a polygon, the 2108 elevation layer was selected for a reference depth (note: the normal full summer elevation of Coeur d'Alene Lake is 2128 feet). This was the deepest bathymetry polygon available in the data set for bathymetry provided. In addition, the bathymetry of Lake Coeur d'Alene is such that there are extremely steep drop offs along all shorelines in this range. The Plan suggests using the 30 foot contour, however aquatic plants do not root that deep in the portion of the lake and river included in the Plan, and there is very little spatial difference between the 20 and 30 foot contour levels because of the steep underwater slopes.

The first mapping task was to perform an Aerial Shoreline Analysis (ASA) mission. ASA is a technology that was developed by AquaTechnex to image and map aquatic plant communities using remote sensing and GIS technologies. The technology involves the use of aircraft flights to collect high resolution low level oblique aerial imagery of the entire littoral area. Flight protocols are developed to maximize water penetration and lighting conditions ideal to detect and map aquatic plant beds. A Nikon GPS camera is utilized to collect seamless imagery of the shoreline and littoral areas of the lake. The photography is shot to obtain a 30 percent overlap from image to image. Two flights were performed in August during the aquatic plant growth period. The morning flight was performed when sun angles were ideal to image western and northern shoreline areas. The afternoon flight was flown to image eastern shoreline area when sun angles were ideal for that portion of the lake. The results of this effort are shown in Figure 3. The following habitat rankings were utilized.

Low Priority Suitable Substrate - The vast majority of the shoreline in the non-tribal waters of Lake Coeur d'Alene are classified as low priority based on habitat conditions present. These areas have very steep drop offs to water too deep to support aquatic plants. In addition, the vast majority of these areas have a rock substrate not conducive to supporting aquatic plant growth. There was no observed evidence of aquatic plant life rooted in these areas. These areas are denoted on the maps as green lines or polygons in the Habitat Suitability Maps.

Moderate Priority Suitable Habitat - Areas of the lake littoral area that had some evidence of aquatic plant colonization were inspected for substrates. Areas that supported limited growth of aquatic vegetation and had other factors such as very narrow littoral band, hard compact sediments or smaller rock cobble were classified after inspection as Moderate Priority Suitable Habitat. These areas are denoted on the maps as yellow lines or polygons in the Habitat Suitability Maps.

High Priority Suitable Habitat - Areas of the lake that exhibited conditions suitable to sustain aquatic plant growth were classified as High Priority. These areas generally had very well established aquatic plant communities present. The majority of the bays on the lake have inflow streams or creeks. Sediment deposit from eroded uplands in the delta areas of these bays provides excellent substrate for aquatic plant growth. The majority of the areas classified as High Priority are in protected bays and coves on the lake. These high priority areas are denoted as red lines or polygons in the Habitat Suitability Maps.

Milfoil was identified in Harrison Slough and Mica Bay. Locations were also mapped in Windy Bay and Sixteen to One Bay. The final report is located in Appendix C.

3.4 2011 ISDA Surveys

ISDA completed aquatic plant surveys in Cougar Bay, Kidd Island Bay, Mica Bay, Blackwell Island, Silver Beach, Third St, Coeur d'Alene Resort, Mineral Ridge, Higgins Point, and Harrison Slough (Figure 4). No invasive aquatic plants were observed at any of these locations with the exception of milfoil in Harrison Slough.

In addition to surveying for invasive aquatic plants, zebra /quagga mussel veliger sampling was conducted five times at multiple locations in Coeur d'Alene Lake. Sampling sites included the Coeur d'Alene Resort, Blackwell Island, Cougar Bay, Mica Bay, Mineral Ridge, Higgins Point, and Harrison Slough (note: mussel sampling is not required by the Plan). No invasive mussels were identified.

4.0 2011 EDUCATION/OUTREACH

Avista created an education brochure describing milfoil and milfoil identification, discussing the known distribution of milfoil in Coeur d'Alene Lake and outlining preventative measures for the spread of milfoil. The brochure will be distributed to the public in 2012.

Avista partnered with Kootenai County and provided educational items for the North Idaho Fair. The primary message of the "give-away" items was focused on preventing the spread of invasive aquatic weeds by educating boaters on the importance of cleaning, draining and drying boats.

Avista reviewed public boat launches to asses current signage regarding aquatic weeds. Avista will continue efforts with the managing entities of the boat launches to coordinate future signage as appropriate.

5.0 MANAGEMENT/TREATMENTS

Kootenai County contracted with Lakeland Restoration Services, LLC (LRS) to perform a 260.4 acre herbicide treatment for milfoil in Harrison Slough. The herbicide treatment was completed on August 30, 2011. The specific information regarding pre-treatment surveys, applied herbicides and equipment is contained in the final report located in Appendix D.

6.0 MILFOIL MANAGEMENT IN COEUR D'ALENE LAKE TRIBAL WATERS

In addition to working with the various entities to monitor and control aquatic weeds on Coeur d'Alene Lake outside the Reservation, Avista also funded significant aquatic weed control efforts on Reservation waters in 2011. These efforts are summarized below.

Dye Study
In an effort to refine the understanding of wind-induced water movement (as this could affect potential herbicide flushing out of application areas and lessening of treatment efficacy), Avista and the Tribe developed a Dye Study Plan in conjunction with Dr. Kurt Getsinger of the United States Army Corps of Engineers Waterways Experiment Station, a nationwide expert in aquatic herbicides and dye tracer studies. The Dye Study Plan described the application and monitoring of the dye (rhodamine WT) in eight sites, which represented the various open-water and shoreline situations in Tribal waters. Results of the dye study will be available in early 2012.

Herbicide Treatment Study
Herbicide treatments were performed on a limited basis within vertical curtain enclosures to allow for a determination of the minimum dose of two herbicide products for effective control of milfoil. Fourteen one-half acre enclosures were set up in Benewah and Hidden Lakes, treated with three different doses of DMA 4 IVM (a liquid) and Navigate (a granular) and monitored. Herbicide treatment monitoring data will be compiled and reviewed in early 2012 to provide direction for future herbicide applications.

Diver Suction
A.C.E. Diving completed diver suction removal along the inner banks of the St. Joe and St. Maries rivers from July 6 through August 2, 2011 on approximately 12 acres of milfoil. The volume of milfoil removed (mixed with some amount of native plant material) was 327 cubic feet. The diver suction work was funded in part by a grant the Tribe received from ISDA.

Bottom Barriers
A.C.E. Diving also performed placement of bottom barriers at areas along the western shoreline of Coeur d'Alene Lake where milfoil was found during the 2010 diver survey. As planned, one-half acre was treated with 218 10' x 10' barrier panels. Installation started on August 8th and was completed on the 11th.

Monitoring
Monitoring and mapping of milfoil and other potential aquatic nuisance species was completed in Chatcolet Lake. Initial mapping of uncorrected survey data indicate approximately 800 acres have sparse to moderate milfoil presence.

Public Awareness and Education
Avista and the Tribe are currently developing a brochure that is focused on milfoil (previously discussed in Section 4.0). Additionally, the required Public Notices regarding the herbicide applications were placed in the local Spokesman Review newspaper and on docks and at boat launches in the areas that were treated with herbicides.

7.0 FUNDING

In 2011 Avista made funding available for the following tasks:

Monitoring	**COST**
Avista provided funding to IDEQ for the purchase of SCUBA equipment.	$ 8,500.00
Avista provided funding to Kootenai County to complete a diver survey on the Spokane River between Coeur d'Alene Lake and the Post Falls dams.	$ 4,000.00
Avista coordinated with Kootenai County, ISDA, IDEQ, and the Tribe to identify and map suitable habitat for Eurasian watermilfoil.	$16,000.00
Education	
Avista participated in the North Idaho Fair as a partner with both Kootenai County and IDEQ providing "give-aways", brochures, merchandise as needed and within budget.	$ 1,500.00
TOTAL	**$30,000.00**

8.0 PLANNED ACTIVITES FOR 2012

As outlined in the Plan, Avista annually identifies areas for upcoming surveys, reviews available funding and schedules an annual meeting with cooperating parties. As a result of coordination activities, funding requests are reviewed and a final program task list is completed prior to May 1 on an annual basis. At the writing of this report, Avista is in the process of scheduling the annual coordination meeting in February.

9.0 REFERENCES

APHA (American Public Health Association). 1995. Standard methods for the examination of water and wastewater. 19th Edition. Washington, D.C.

Borman, S., Korth, R., and J. Temte. 1997. Through the Looking Glass: A Field Guide to Aquatic Plants. University of Wisconsin Press, Madison, WI. 256 pp.

Coeur d'Alene Tribe Lake Management Department (CDAT). 2006. 2006 Coeur d'Alene Tribe Eurasian Watermilfoil Control Program Project Completion Report. Coeur d'Alene Tribe Lake Management Department, Plummer, ID.

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DiTomaso, J.M., and E.A. Healy. 2003. Aquatic and Riparian Weeds of the West. Publication 3421. University of California Agriculture and Natural Resources, Oakland, CA. 442 pp.

Prather, T., S. Robins and S. Daniel. 2003. Eurasian Watermilfoil (Myriophyllum spicatum) Identification and Management in Idaho, CIS 1108. University of Idaho College of Agricultural and Life Sciences, Moscow, ID.

Washington State Department of Ecology. 2001. An Aquatic Plant Identification Manual. Publication 01-10-032. 195 pp.

FIGURE 1

POST FALLS HED PROJECT BOUNDARY MAP

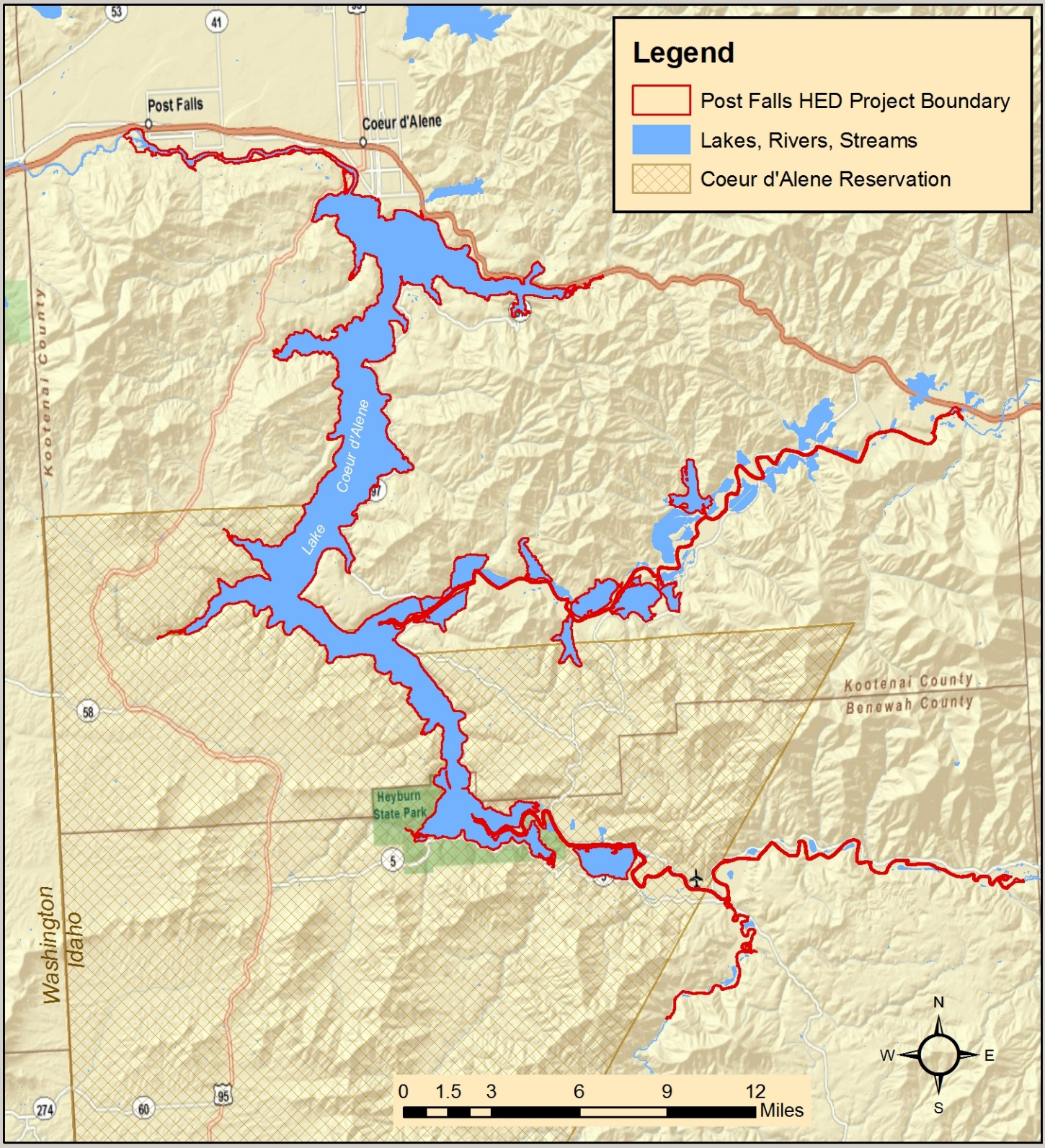


Figure 1
Post Falls HED
Project Boundary Map

FIGURE 2

IDEQ MILFOIL SURVEY RESULTS


One plant found and pulled in 16 to 1 Bay, Coeur d'Alene Lake, ID
Multiple patches of Milfoil In Windy Bay, Coeur d'Alene Lake, ID
Part of a plant found in the sample bag in Aberdeen Lodge Bay, Coeur d'Alene Lake, ID

Figure 2

FIGURE 3

MILFOIL HABITAT MAPPING

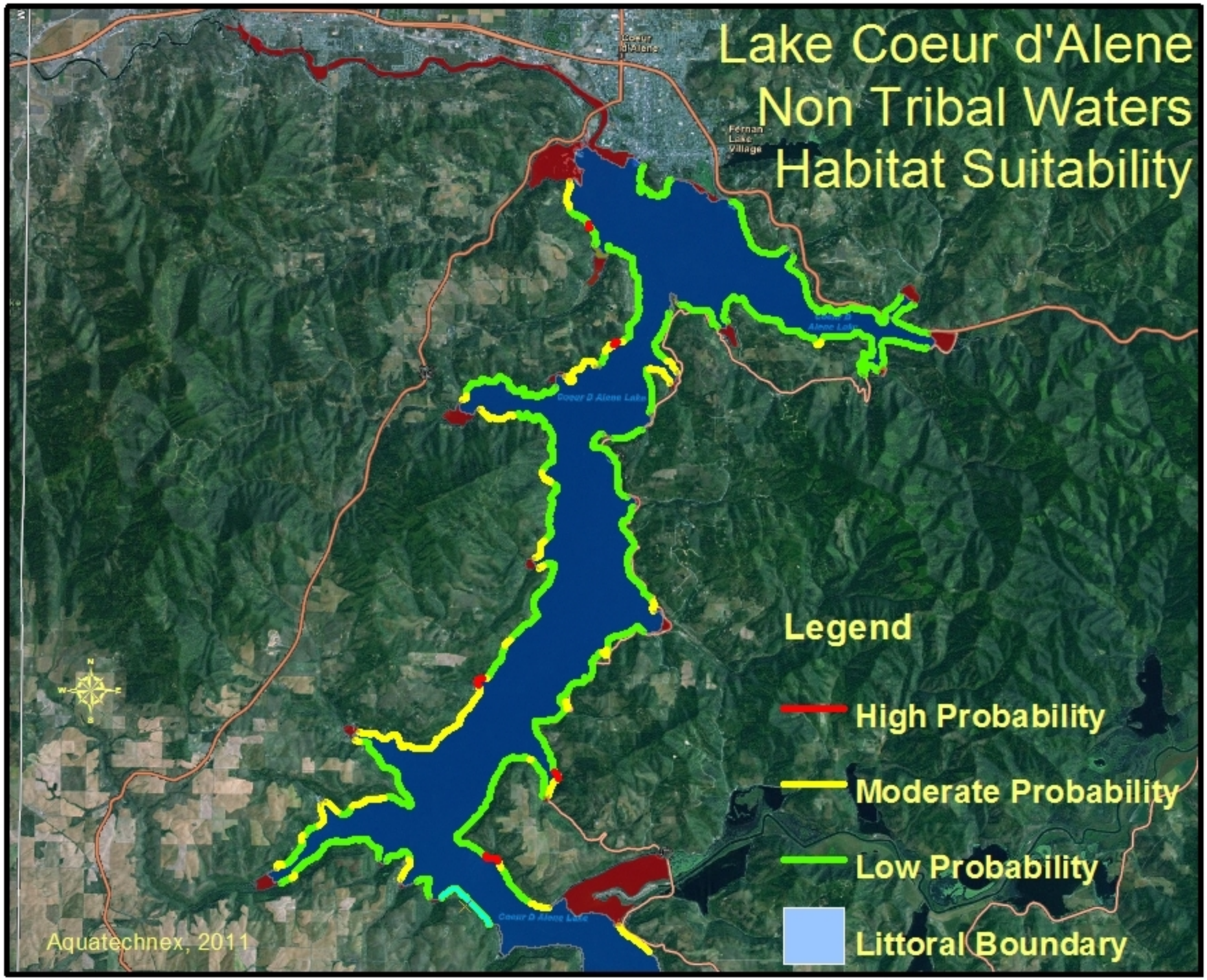

Lake Coeur d'Alene
Non Tribal Waters
Habitat Suitability
Legend
High Probability
Moderate Probability
Low Probability
Littoral Boundary
Aquatechnex, 2011

Figure 3

FIGURE 4

ISDA SURVEY MAP

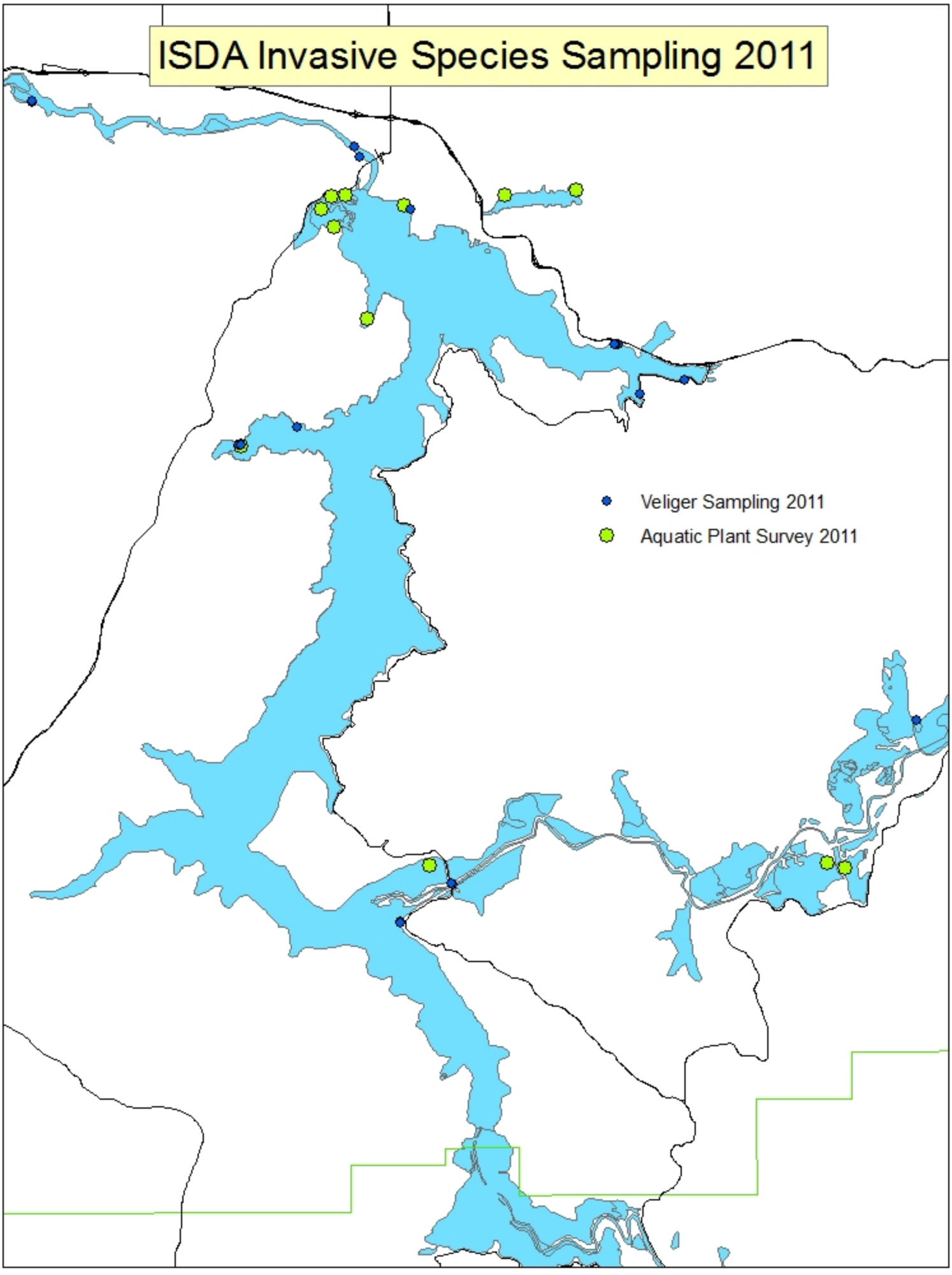

ISDA Invasive Species Sampling 2011
Veliger Sampling 2011
Aquatic Plant Survey 2011

Figure 4

APPENDIX A

MEETING MINUTES

MEETING MINUTES:
ANNUAL MEETING
Coeur d'Alene Lake Aquatic Weed Management for Non-Tribal Waters

Meeting Place: IDEQ Office, Coeur d'Alene, ID
Meeting Date & Time: 3/21/11, 1-3 pm

1. INTRODUCTIONS

In attendance: Glen Rothrock (IDEQ), Glen Pettit (IDEQ), and Becki Witherow (IDEQ), Linda Ely (Kootenai County/IECWMA), Dave Armes (Avista), and Meghan Lunney (Avista).

**Dave Lamb (Coeur d'Alene Tribe) and Tom Woolf (ISDA) were unable to attend the meeting, however both provided input prior to the meeting.

2. REVIEW 2010 ACTIVIES

IDEQ

Survey

IDEQ completed a rooted aquatic vegetation survey in Rockford Bay. This was their kick-off training and pilot study which has the following overarching goals: to survey and monitor any migration of Eurasian watermilfoil (milfoil) from the southern portion of the lake; to quantify biomass and nutrient storage; and to characterize bay ecology. During the pilot study IDEQ documented aquatic plant communities using rake tosses, quadrats along transects, and video footage. Results are summarized in the IDEQ Coeur d'Alene Lake Management Plan, Aquatic Vegetation Survey, Rockford Bay Pilot Study (January 2011).

Treatments

IDEQ does not complete milfoil treatments.

Education

IDEQ printed 10,000 Coeur d'Alene Lake maps for public distribution. The maps have an educational/outreach message regarding milfoil and invasive species (specific to zebra and quagga mussels). IDEQ also had a booth at the North Idaho Fair.

IECWMA/KOOTENAI COUNTY

Survey

ISDA awarded grant money to IECWMA. Kootenai County hired Lakeland Restoration to complete a milfoil survey of northern bays. Linda indicated they hit every bay north of Rockford and no milfoil was observed.

Treatments

The following treatment summary was copied from the *Eurasian Watermilfoil Control In the Inland Empire 2010 Year End Report* (IECWMA):

*Lakeland Restoration Services chemically treated 33 acres in **Cave and Medicine Lakes** located in the Chain Lakes area of Kootenai County using 642.5 gallons of the herbicide DMA4 (active ingredient 2,4-D) at the rate of 2ppm. Posting was completed on June 25, 2010 by Lakeland Restoration Services. Mobilization and application were completed on June 28, 2010. Water*

sampling following application was completed by the Kootenai County Noxious Weed staff and Idaho Department of Fish and Game generously volunteered to do the DO2 testing on Cave and Medicine Lakes.

Herbicide 500 gallons @ $13.75/gal	$ 8,834.38
Contractor	$ 12,740.00
Water Sampling	$ 2,756.25
TOTAL	**$ 24,330.63**

Education

Kootenai County published a legal notice for the herbicide treatments in the Coeur d'Alene Press (distribution of 24,000) and the St. Maries Gazette (distribution 3,300). The Kootenai County Noxious Weed Department has a website which received 877 hits and they have a dedicated phone line to answer questions from the public on the milfoil herbicide treatment. In addition, the IECWMA website on milfoil received 584 hits. Kootenai County (combined with BLM) also had a booth at the North Idaho Fair.

COEUR D'ALENE TRIBE/AVISTA

Survey

ACE Diving was hired by the Coeur d'Alene Tribe (Tribe) through ISDA grant money to complete annual milfoil mapping of Hidden Lake, Benewah Lake, the St. Joe River, and the western shoreline of Coeur d'Alene Lake. The annual mapping began on August 24th and was completed on September 28th. The mapping indicated 400 additional acres of milfoil infested areas more than the original survey identified. In addition, the Tribe completed a survey of Black Lake on October 8, 2010 and identified 32 acres of milfoil infested areas.

Treatments

AquaTechnex was hired to complete herbicide application (liquid herbicide 2,4-D formulation DMA 4 IVM®) at a dosage of 3.3 ppm to 538-acres of milfoil infested waters located in Chatcolet Lake, Round Lake, and the southern end of Coeur d'Alene Lake. The herbicide application extended from August 18, 2010 through August 20, 2010. The Tribe completed pre- and post- treatment rake surveys to measure the treatments efficacy.

In-situ water quality monitoring (including temperature, pH, specific conductivity, and DO) was conducted at five monitoring sites prior to, during, and following the herbicide application treatments. Herbicide residue water samples were collected from the same five monitoring locations during and following the herbicide treatments and residue testing of water potato tuber samples was conducted prior to and following the herbicide treatment. Additional in-situ temperature profile monitoring was conducted in each of the eleven treatment areas prior to, during, and after the herbicide applications, as requested by the Department of Interior in order to ensure bull trout and bull trout habitat were not affected by the herbicide application.

ACE Diving was hired by the Coeur d'Alene Tribe (Tribe) through ISDA grant money to complete diver suction removal of 2-acres of milfoil infested waters in the St. Joe and St. Maries Rivers.

Education

With regard to the herbicide application, a legal notice was posted for the herbicide treatments in the Coeur d'Alene Press on August 8th, a shoreline notice was mailed to all shoreline property owners within one mile of the planned treatment areas on August 5th, and a shoreline notice was posted along public and private docks within ¼-mile of the treatment areas within 24 hours prior to the herbicide treatment.

AVISTA

Per Article 410 of Avista's Spokane River Project FERC License, Avista completed a Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters and submitted it to FERC on June 18, 2010. FERC approved the Plan on January 19, 2011.

ISDA

Education

The ISDA provided grant money to Kootenai County/IECWMA and the Tribe for milfoil survey, treatments, and education in Coeur d'Alene Lake. In addition, four boat inspection stations were set up at the port of entry, Rose Lake/ITD property, Garwood, and Sandpoint.

3. REVIEW CURRENT INFESTATION

The group discussed the current milfoil infestation is located in Cave Lake, Medicine Lake, Harrison Slough, Black Lake, the southern third of Coeur d'Alene Lake, the St. Joe and St. Maries Rivers.

4. REVIEW 2011 PROPOSED ACTIVITIES

IDEQ

Survey

IDEQ plans on completing a rooted aquatic vegetation survey in six bays which may include Windy, Mica, Cave, Loffs, Powderhorn, Carlin, and Echo Bays. The surveys will begin in late June and consist of four days per bay (two days of rake survey and two days of diving). IDEQ plans on surveying six bays each year, for four years which should cover all the northern bays. The objective will be to obtain biomass and nutrient data associated with the Lake Management Plan; however the surveys will also look for milfoil infestations within the lake's northern bays.

Glen Rothrock would like to have clarification from Tom Woolf on what bays ISDA will be surveying in August so that there is no duplication of survey efforts. Glen also indicated IDEQ would be interested in pursuing water quality profiles in Harrison Slough to help understand diurnal effects of dense milfoil growth on nutrients and metals.

Treatments
IDEQ does not conduct milfoil treatments.

Education
IDEQ and the Tribe will be holding a Water Quality workshop on May 4th from 5:30 to 7:30 pm at the Coeur d'Alene Library, a time slot is allocated for a discussion on milfoil. In addition, IDEQ will be completing a field workshop with Camp Cross at McDonalds Point in Loft Bay. If all goes well IDEQ would like to extend this prototype to additional audiences in subsequent years.

IDEQ will continue to distribute the Coeur d'Alene Lake maps printed for public distribution. The maps have an educational/outreach message regarding milfoil and invasive species (specific to zebra and quagga mussels). IDEQ also had a booth at the North Idaho Fair in 2010 and plans for a booth in 2011.

IECWMA/KOOTENAI COUNTY

Survey
Kootenai County plans on hiring Lakeland Restoration to complete a milfoil survey in the Spokane River from the outlet of Coeur d'Alene Lake to the Post Falls Dam.

Treatments
Kootenai County plans on going out for bid for herbicide treatments in Cave and Medicine Lakes.

Education
Kootenai County (and BLM) will have a booth at the North Idaho Fair and will maintain their two milfoil websites (through the Kootenai County Noxious Weed Board and IECWMA). Kootenai County is also working on an educational brochure.

COEUR D'ALENE TRIBE/AVISTA

Survey
The Coeur d'Alene Reservation Aquatic Weed Management Plan specified annual mapping would be completed on a three year rotation. Since 2011 represents the second year of the Plan's implementation, annual mapping will be completed in the area specified during the Year 2 Rotation, which is Chatcolet Lake.

Treatments
Avista and the Tribe will complete herbicide application in localized areas (30-40 acres) of milfoil infested waters in the southern portion of Coeur d'Alene Lake and the lower lakes. The goal of the localized treatments will be to gain a better understanding of water movement and nutrient concerns associated with herbicide applications in the lake. The results will be used to guide future large-scale herbicide treatments. Water quality monitoring, temperature profiles, and herbicide residue sampling will be completed during the herbicide treatments. In addition, pre- and post- treatment rake surveys will be completed to measure the efficacy of the herbicide treatment.

Diver suction will target four acres of milfoil infested waters in the St. Joe and St. Maries Rivers. In addition, bottom barriers will be installed at 0.5-acres in low density narrow bands of milfoil-infested waters along the western shoreline of Coeur d'Alene Lake.

Education
Avista and the Tribe will complete an educational brochure, publish articles in the local newspaper, conduct one to two localized workshops, and present to the Tribal Council of upcoming activities.

ISDA

Survey
ISDA will conduct targeted surveys in high use areas (NIC Beach, Harrison, Mica Bay, and possibly a deep water site near NIC Beach) in conjunction with zebra/quagga mussel sampling activities. ISDA will also be conducting four velliger sampling events.

In addition, ISDA plans on dedicating several days late in the season (August) specifically to complete a milfoil/invasive plant early detection survey in the northern portion of the lake.

Education
ISDA will have two boat inspection stations off I-90 (Huetter Rest Stop and Cataldo exits).

ISDA would like to see a focused study on milfoil in Harrison Slough. Tom Woolf suspects the dense milfoil growth in Harrison Slough contributes to low dissolved oxygen levels and subsequent metal and nutrient release into the bay. Specifically, Tom indicated a comparison study of DO, nutrient levels and metal tissue levels between plants in the slough and in a native plant area would help to understand the impacts of milfoil on the system.

Meeting Place: IDEQ Office, Coeur d'Alene, ID
Meeting Date & Time: 3/21/11, 1-3 pm

AVISTA

Survey
Avista shall provide funding (approximately $8500) to IDEQ for the purchase of SCUBA equipment that will be utilized to survey up to 6 bays in Lake CdA annually for a projected total of 24 bays over the next 4 years (total bays may vary as additional mapping and survey needs arise). IDEQ and Avista shall coordinate to insure the IDEQ surveys adhere to the Spokane River License requirements and follow survey procedures established by ISDA. IDEQ shall provide an annual summary report to Avista.

Avista shall provide funding (approximately $4000) to Kootenai County to complete a diver survey between Lake CdA and Post Falls Dam. Kootenai County shall provide Avista with an annual summary report.

Avista will coordinate with IECWMA, the Tribe, ISDA and IDEQ to identify and map suitable habitat for Eurasian watermilfoil (using existing datasets). Habitat suitable for EWM includes unshaded waters with a depth less than 30 feet and much, clay or silt substrates. Avista will consult with IECWMA, the Tribe, ISDA and IDEQ to partition suitable habitat into high, moderate and low survey priority categories based on susceptibility to infestation. Categorization of susceptibility will be founded on proximity to existing infestations, public boat launches, prevailing currents and recreational use patterns. Areas where infestations are known to exist will be classified as high priority suitable habitats. Annual monitoring based upon the mapping priorities shall be as follows: High (1 per 3 years); moderate (1 per 4 years); low (1 per 5 years).

Treatments
No treatments are currently planned for 2011

Education
Avista will work with IECWMA to develop (or expand on an existing) educational and awareness program. This purpose is to identify effective means to expand outreach programs with a focus on educating recreationists about threats posed by EWM and actions that can be taken to prevent its spread. Elements of the educational and awareness program could include:

1. Preparation and distribution of an annual information newsletter to residents who own shoreline property adjacent to bays classified as high-priority suitable habitat within non-tribal Project waters;

2. Informational presentations to groups likely composed of CdA Lake recreationists (member of lakeshore associations, sporting groups, boat clubs, and marina groups. One

to two presentations will be targeted per year initially. The frequency of presentations may be modified over time in coordination with the cooperating parties.

3. Provide funding through IECWMA to implement outreach elements.

4. Additional educational and awareness programs identified by the group.

5. REVIEW FUNDING AVAILABLE
Avista budgeted $30,000 for 2011 activities.

6. FUNDING REQUESTS
The following funding requests have been received:

- IDEQ requested $8,471 to purchase SCUBA gear. The SCUBA gear would provide IDEQ more flexibility in sampling, more opportunity to take advantage of long daylight hours, and allow sampling to continue if unexpected delays were encountered. Compared with the cost of renting the equipment, IDEQ indicated the SCUBA gear would pay for itself in little over two years. The gear would be used as part of their ongoing program to survey six bays per year, hitting all the northern bays within a four-year timeframe.
- Kootenai County requested $3,500 to hire Lakeland Restoration to complete a milfoil survey from the outlet of Coeur d'Alene Lake to the Post Falls Dam.

7. **SCHEDULE ADDITIONAL MEETINGS**
The group decided it would be very beneficial to schedule a follow up meeting in mid May to further coordinate the 2011 activities.

2011 Work Plan Coordination Meeting Minutes
Coeur d'Alene Lake Aquatic Weed Management for Non-Tribal Waters

Meeting Place: IDEQ Office, Coeur d'Alene, ID
Meeting Date & Time: 5/20,2011, 1-3 pm

In attendance:
Glen Rothrock (IDEQ), Glen Pettit (IDEQ), Becki Witherow (IDEQ), Linda Ely (Kootenai County), David Armes (Avista), Dave Lamb (Coeur d'Alene Tribe) and Tom Woolf (ISDA).

Highlights:

- The group verified with ISDA that the IDEQ surveys meet and exceed the ISDA protocol.
- The group discussed year end summary reports will be submitted to Avista by mid November (IDEQ, Koot Co and subcontractors). After reviewing the schedule, I have some concerns on timelines, could we get the reports in by end of October? In turn Avista will provide year end summary reports to the cooperating parties by 31 December.
- Avista will contract directly with Lakeland to complete a boat survey between Post Falls Dam and the lake.
- Linda will provide a detailed scope of work to Avista for contracting purposes.
- Bathometry data is available for the habitat mapping project.
- NAD 83 is the preferred coordinate system for the habitat/existing weed inventory.
- The 2011 work plan was finalized and is attached.
- ISDA has a crew completing survey/early detection in CdA Lake.

Appendix A

2011 Work Plan Coordination Meeting Minutes
Coeur d'Alene Lake Aquatic Weed Management for Non-Tribal Waters

Meeting Place: IDEQ Office, Coeur d'Alene, ID
Meeting Date & Time: 5/20,2011, 1-3 pm

2011 COMBINED WORK PLAN ACTIVITIES

Monitoring
Avista shall provide funding to IDEQ for the purchase of SCUBA equipment. SCUBA equipment will be utilized to survey 6 bays in Lake CdA annually. A total of 24 bays will be surveyed over the next 4 years. IDEQ and Avista shall coordinate to insure the IDEQ surveys adhere to the Spokane River License requirements and follow survey protocol procedures established by ISDA. IDEQ shall provide an annual summary report to Avista.
Avista shall provide funding to Kootenai County to complete a diver survey between Lake CdA and Post Falls Dam. Kootenai County shall provide Avista with an annual summary report.
Avista will coordinate with Koot Co., the Tribe, ISDA and IDEQ to identify and map suitable habitat for Eurasian watermilfoil. Habitat suitable for EWM includes unshaded waters with a depth less than 30 feet and muck, clay or silt substrates. Avista will consult with Koot. Co, the Tribe, ISDA and IDEQ to partition suitable habitat into high, moderate and low survey priority categories based on susceptibility to infestation. Categorization of susceptibility will be founded on proximity to existing infestations, public boat launches, prevailing currents and recreational use patterns. Areas where infestations are known to exist will be classified as high priority suitable habitats. AquaTechnex will complete an aeiral survey of the project area (Non-Tribal and Tribal waters) and provide mapping of existing aquatic weeds. As part of this process a habitat map will also be developed.
EDUCATION/OUTREACH
Avista will participate in the North Idaho Fair as a partner with both Koot. Co and IDEQ providing give aways, brochures and merchandise as needed and within budget.
Avista will coordinate and review public boat launches to confirm current signage is available and viewable regarding aquatic weeds. If signs are not located at the boat launches, Avista will coordinate with the boat launch to get signage placed in appropriate areas.
MANAGEMENT/TREATMENT
Herbicide treatment of Cave/Medicine Lakes by Koot Co.

APPENDIX B

SPOKANE RIVER AQUATIC PLANT SURVEY

Lakeland Restoration Services, LLC
18 ERiver Spur Rd. Priest RIVer, ID 83856
Phone/Fax: 1208] 448-2222
www.lakelandrs.com

AQUATIC PLANT SURVEY- SEPTEMBER 19, 2011
SPOKANE RIVER

FINAL REPORT

On September, 19, 2011 Lakeland Restoration Services, LLC (LRS) performed a survey on Spokane River for Avista. The goals and objectives of this survey were as follows:

- To quantify the distribution and frequency of all aquatic vegetation on a lake-wide scale.
- To identify new populations of invasive aquatic and emergent plants.
- To identify new populations of other invasive aquatic species.

To accomplish the above goals LRS conducts surveys in the following manner:

Littoral Survey

In order to identify EWM and other exotic plant populations, a survey of the lake's entire littoral area is conducted. The littoral zone is defined as the shallow area near the shore of a body of water that extends from the shoreline lakeward to the limit of occupancy of rooted plants. This survey is conducted from a boat using rake throws and or underwater viewers, by snorkeling or by SCUBA divers. The entire littoral zone will be surveyed by navigating in a regular pattern so that the entire bottom is observed. If surveying from a boat, regular rake throws are conducted to check for EWM in areas with limited visibility. As water clarity decreases, the frequency of rake sampling is increased, paying special attention to boat ramps. When EWM or other exotic aquatic species are found, the GPS location is recorded, the area of growth is outlined with the GPS, and the percent cover is estimated. Cover estimates are recorded as either dense, sparse or no EWM cover. When the bottom cannot be seen underwater viewers and rake throws are used to determine the percent of cover. Also noted with GPS coordinates is the location of invasive emergent shoreline plants as they are detected (purple loosestrife, phragmites, yellow iris, tamarisk, Russian olive, etc.).

Point Intercept **Survey**

The point intercept method is a relatively quick and effective way of quantifying the distribution and frequency of aquatic vegetation. Points are pre-selected and are placed in a regularly spaced grid or at random points on a GIS generated map of the water body. Sampling in this manner tracks changes over time in the aquatic plant community by repeatedly returning to the same points for sampling (Madsen 1999).

A point intercept survey of a body of water is typically conducted in two person teams. One person navigates the boat with a GPS to the proper point and a second person makes observations. Upon arrival at a sampling point, the depth is recorded and, if possible, the sediment type (mud, sand, rock or organic) is determined. The reader then observes an area of water over the side of the boat using the same side of the boat every time. Species observed from the surface within the area are recorded on a data sheet. Sample rakes are used in areas where the bottom cannot be clearly seen. Samples are taken with two rake throws in a crossing pattern within the 1m x 1m sampling area and all additional

species are recorded (Parsons et al. 2001). The GPS coordinates are recorded for any EWM that is observed while traveling between sampling points.

A species is only recorded once at each sampling point even if it is observed multiple times on the surface and in rake throws. The data sheets are arranged with all suspected species listed across the top and sample coordinates listed in the left column. When a species is found, a one (1) is marked in the appropriate column for that species. A zero (0) is entered to indicate the absence of a species at that point. Spaces are available for listing new species as they are found. A column will be provided to list various physical stages of EWM in order to gage the effectiveness of treatments a scale of one through five is used to record the status of plants observed. Five indicates no live EWM present, four indicates only a small sprig of EWM (very little live EWM present), three indicates sparse EWM (plants appear stressed, sparse growth, no plants on the surface), two indicates EWM, but not on the water surface (some plants appear distressed but fairly healthy, no plants on the surface) and one indicates EWM on surface (plants appear fairly healthy with little or no apparent control effects, plants on water surface). In addition, a column is provided for a cover estimate. Cover is reported as either dense, sparse or no EWM cover. In small lakes pre- and post treatment point intercept surveys are conducted over the entire water body. The pre-treatment survey is conducted before treatments are applied, preferably within several weeks prior to treatment. The post-treatment survey is a revisit to the same points and should be conducted late in the year (late August or September) in order to assure the maximum treatment effect is observed. In small lakes the pre-treatment survey is conducted concurrently with the littoral survey.

Surveys conducted in large lakes that receive EWM treatments may have two types of point intercept survey conducted:

> *Pre/Post-Treatment Point Intercept Survey:* The pre/post-point intercept survey consists of multiple sampling points arranged in areas where EWM treatments are planned. The points will be established in the treatment areas and will be monitored before and after treatments in order to quantify treatment effects monitored before and after treatments in order to quantify treatment effects (Madsen 2006). Points are arranged in either a regular grid pattern or in a random distribution, depending on the size of the treatment area.
>
> *Lake-Wide Point Intercept Survey:* The second type of point intercept survey will consist of a large grid covering the entire littoral zone of the lake. Sampling in this manner provides lake-wide sampling points that track the lake's aquatic plant community over time. Lake-wide point sampling on larger lakes may be conducted concurrently with the littoral survey.

Invasive Aquatic Species Monitoring

LRS is vigilant to note and sample anything strange, suspicious or out of the ordinary. Invasive species come in all shapes and sizes. Special attention is paid to any plant or animal species exhibiting aggressive growth. Digital photos are taken of anything that may be of interest and samples are collected when possible. Each lake, when surveyed, will also have mussel samplers deployed in order to monitor for zebra and quagga mussel infestation. Substrates are distributed near boat launches lake-wide and are accessible enough to be checked several times a year if feasible.

Sediment type was analyzed during the plant survey. The categories were broken down into rock, sand and mUCk. The river runs through basaltic rock resulting in many locations being rock, sand, or a combination thereof. A basaltic outcropping comes from the north side of the river some areas protrude to the south around areas 75-89. Another extensive area occurs around 32-70 and 92-95. Aquatic Plant growth is limited in these areas due to lack of anchor points for submerged plants and lack of nutrients.

The north side of the river contains more mucky soils; however it appears that tannins from previous lumber mill operations at the mouth of the river have discouraged plant growth. This observation has been noted in other areas of the lake as well as the Coeur d' Alene River. There are many sunken logs still at the bottom of the river, with remnants of milling activity. I believe that Ph changes in

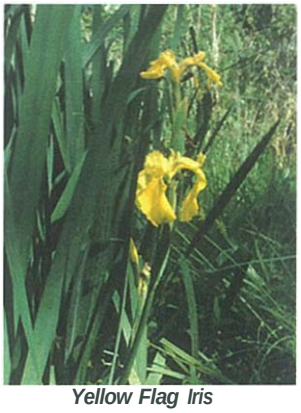
the sediment as a result of these operations have contributed to this condition.

Mucky soils are found in the bays and inlets associated with the river. An example would be areas 82-83-84-and 94 on the north shore, along with 72-75. Low lying areas associated with 63-64-and 65 also contain muck soils.

Brisk water movement throughout the river leading to the dam may contribute to this finding as well.

Invasive plants noted:

During the survey, two invasive plants were noted, Yellow flag Iris (Iris pseudacorus L) and Tree of Heaven (Ailanthus Altissima). Both plants, if allowed to proliferate can have detrimental effects on the native plant community, reduce the quality of recreation on the water body, interfere with hydroelectric operation, and reduce property values.



Yellow Flag Iris

Tree of Heaven

Yellow flag Iris an invasive iris introduced from Europe. It grows monoculturalistically along the riparian areas of the water body. The plant can reproduce by rhizome or seed. The plant consumes large volumes of water thereby, defeating the purpose of water storage in reservoirs. Rhizomes break off and can proVide navigation hazards.

Tree of Heaven (Ailanthus altissima) is an invasive tree introduced from Asia. The tree grows by rhizomatous behavior, grows very tall and thick. The only way to remove this tree is to cut the tree and apply herbicides to the cut surface. Several applications may be required to achieve 100 percent control. Simply cut1ing the tree encourages its spread. Several of the infestations are on private property that appears uninhabited. Landowner cooperation may be required to successfully control this plant.

A Variety of native pondweeds were noted in the survey. The list includes, Leafy pondweed (potamogeton folius), Large-leaf or Big-leaf pondweed (potamogeton ampifolius), American pondweed (potamogeton nodosus), Sago Pondweed (stukenia pectinatus), Richardsons pondweed (potamogeton richardsoni). All pondweeds noted exhibited non-invasive characteristics.

American Pondweed

Leafy Pondweed

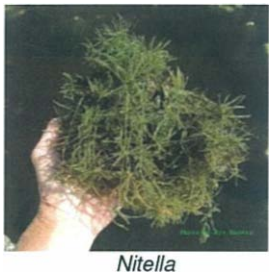
Large-leaf/Big-leaf Pondweed

Sago Pondweed

clasping leaf (Richardson) Pondweed

Curly leaf pondweed (Potamogeton crispus) was not discovered in the survey. CLPW can exhibit invasive characteristics and continued surveys should take place to monitor for this plant.

Other plants noted in the survey include, Elodia Canadianses - Common Elodea, Fan Wart (cabomba), Southern Naid-(Najas guadalupensis), Nitella, Water Buttercup and Widgeon Grass-(rupia maritima L). All these plants were found in small colonies.



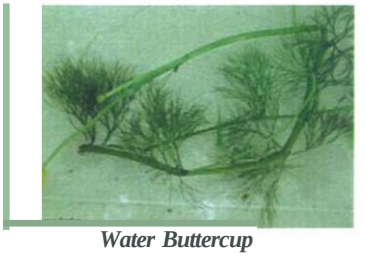
Nitella

Common Elodea

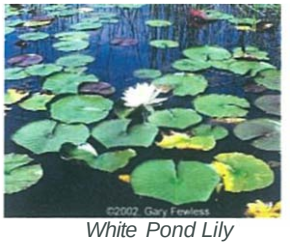
Widgeon Grass

Southern Naid

Fan Wart (eabomba)



Water Buttercup



White Pond Lily

Thread Leaf

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Spokane River Survey 2011 - Avista Utilities

Yellow Flag Iris Locations

September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0,15 0.3 0,6 Miles

Spokane River Survey 2011 - Avista Utilities

Widgeon Grass Locations

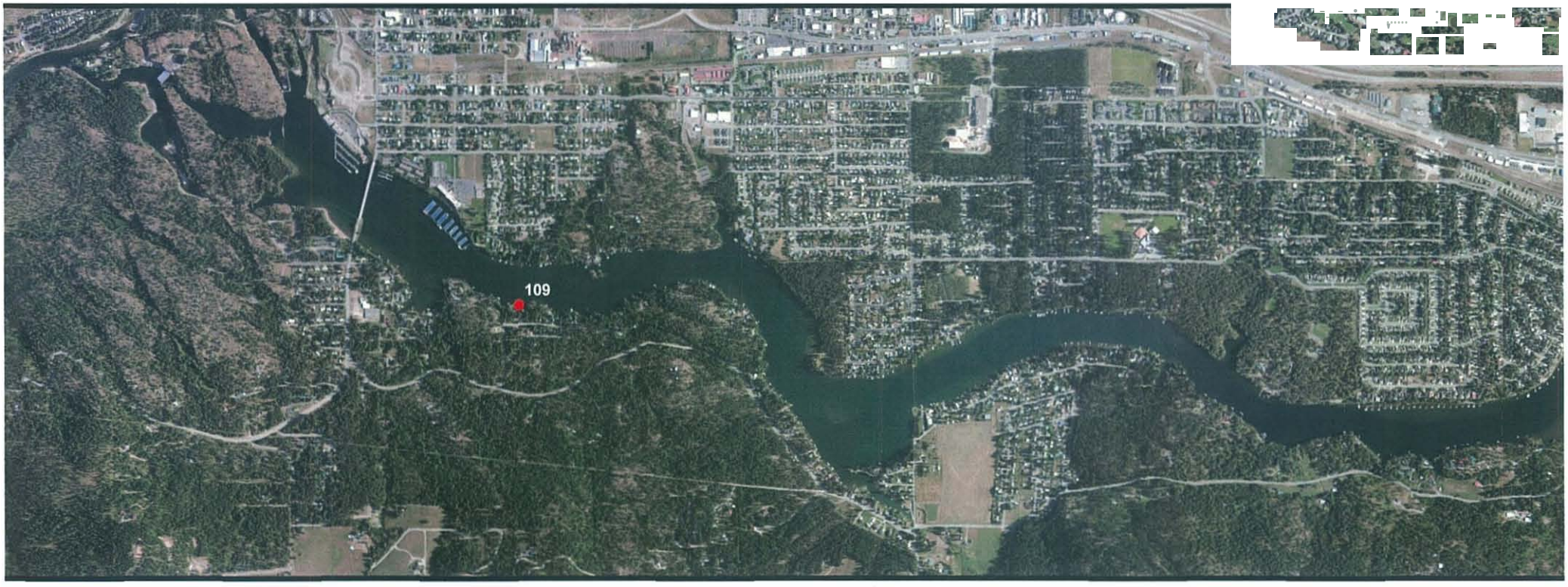
September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 Miles



Spokane River Survey 2011 - Avista Utilities

White Pondlilly Locations

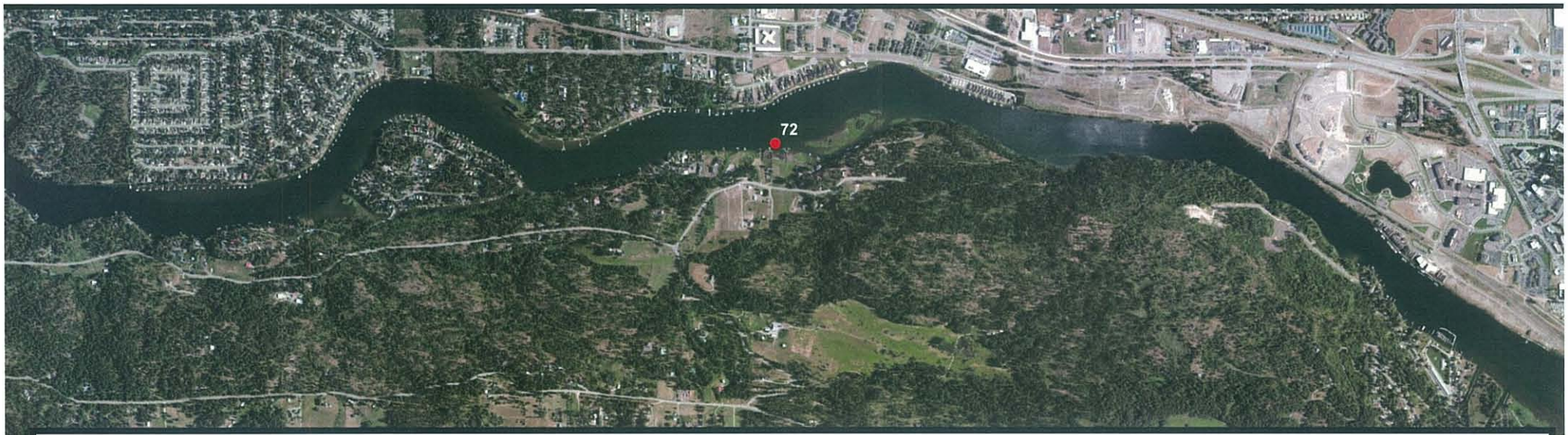
September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 Miles



Spokane River Survey 2011 - Avista Utilities

Water Buttercup Locations

September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16, **2011**

0 0,15 0.3 0.6 Miles

Spokane River Survey 2011 - Avista Utilities

Tree of Heavan Locations

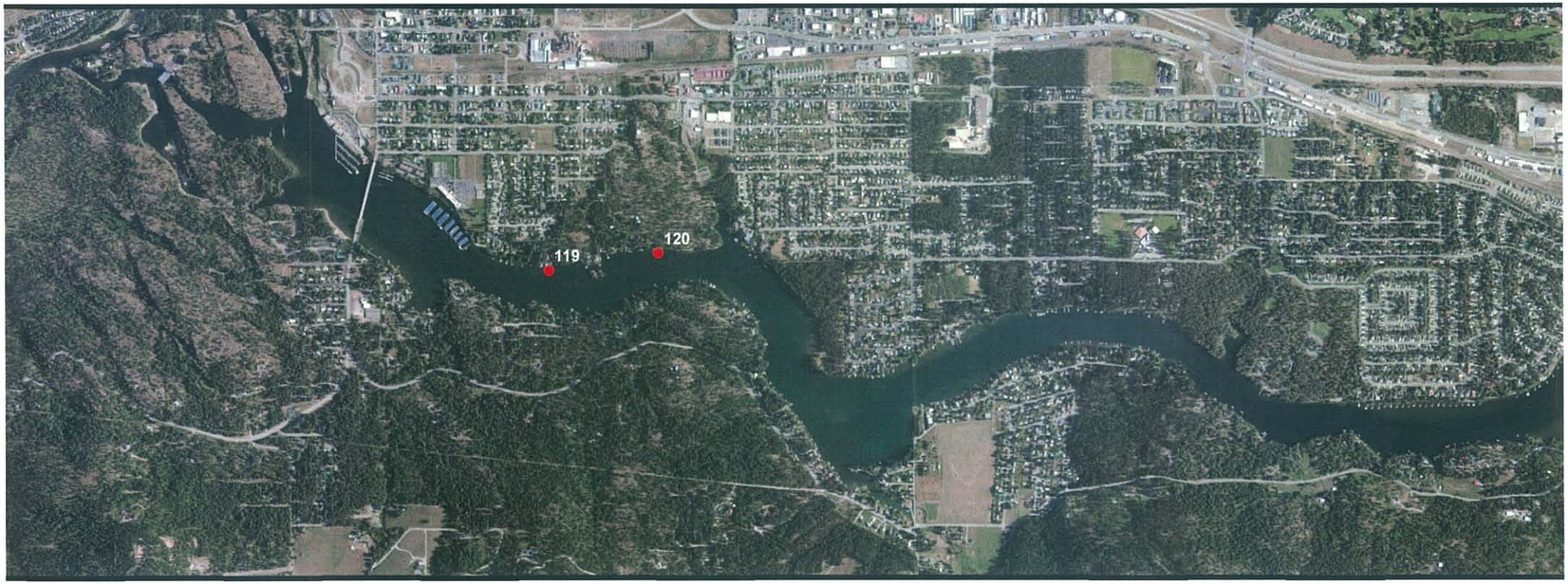
September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16,2011

0 0.15 0.3 0,6 Miles



Spokane River Survey 2011 • Avista Utilities

Thread Leaf Locations

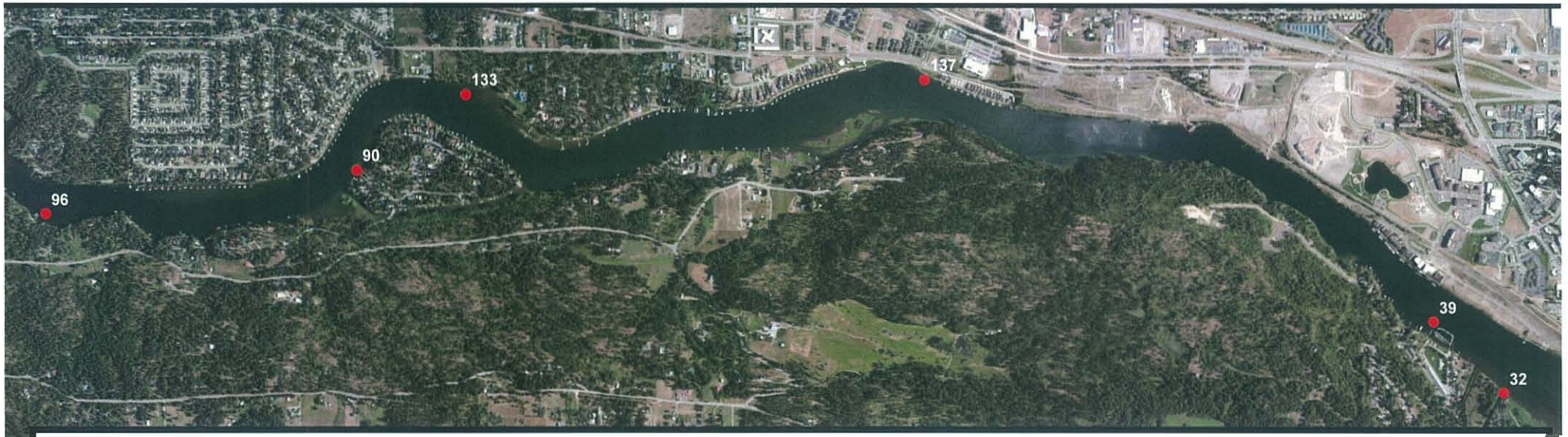
September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 Miles



Spokane River Survey 2011 • Avista Utilities

Sago Pondweed Locations

September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 Miles

Spokane River Survey 2011 • Avista Utilities

Richardsons Locations

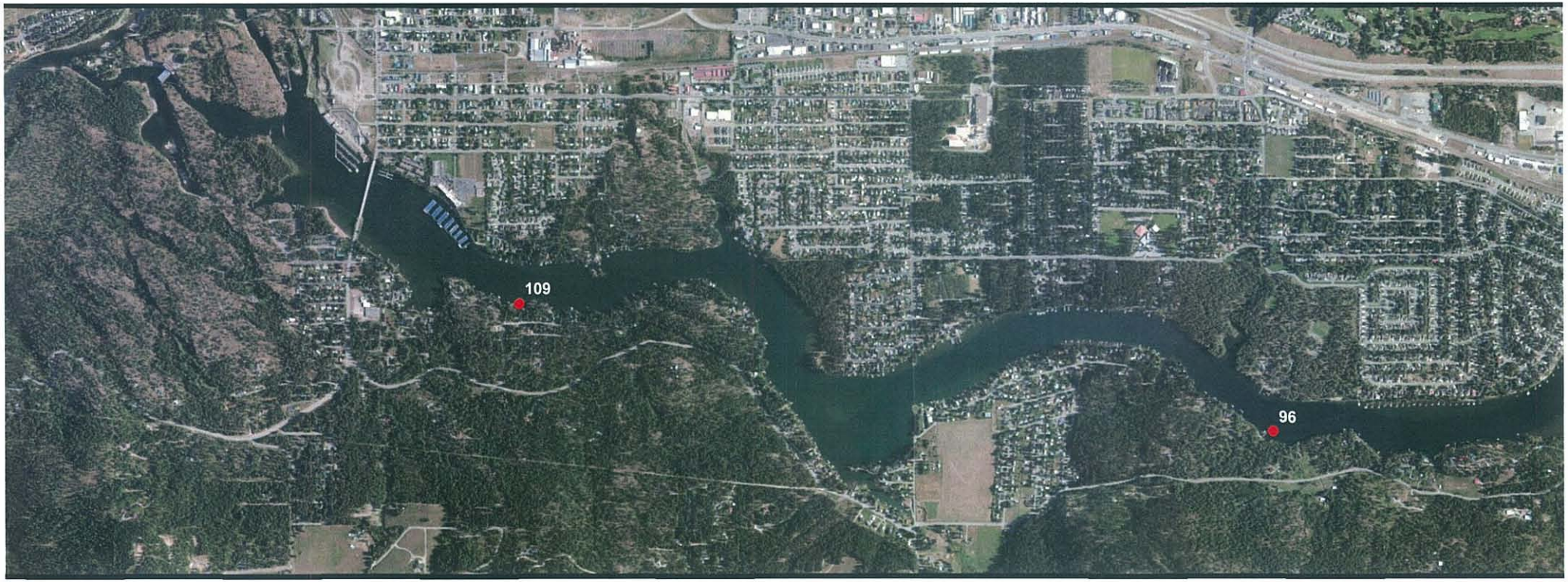
September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, **2011**

0 0.15 0.3 0.6 **Miles**



Spokane River Survey 2011 - Avista Utilities

Nitella Locations

September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 **Miles**

Spokane River Survey 2011 - Avista Utilities

Naid Locations

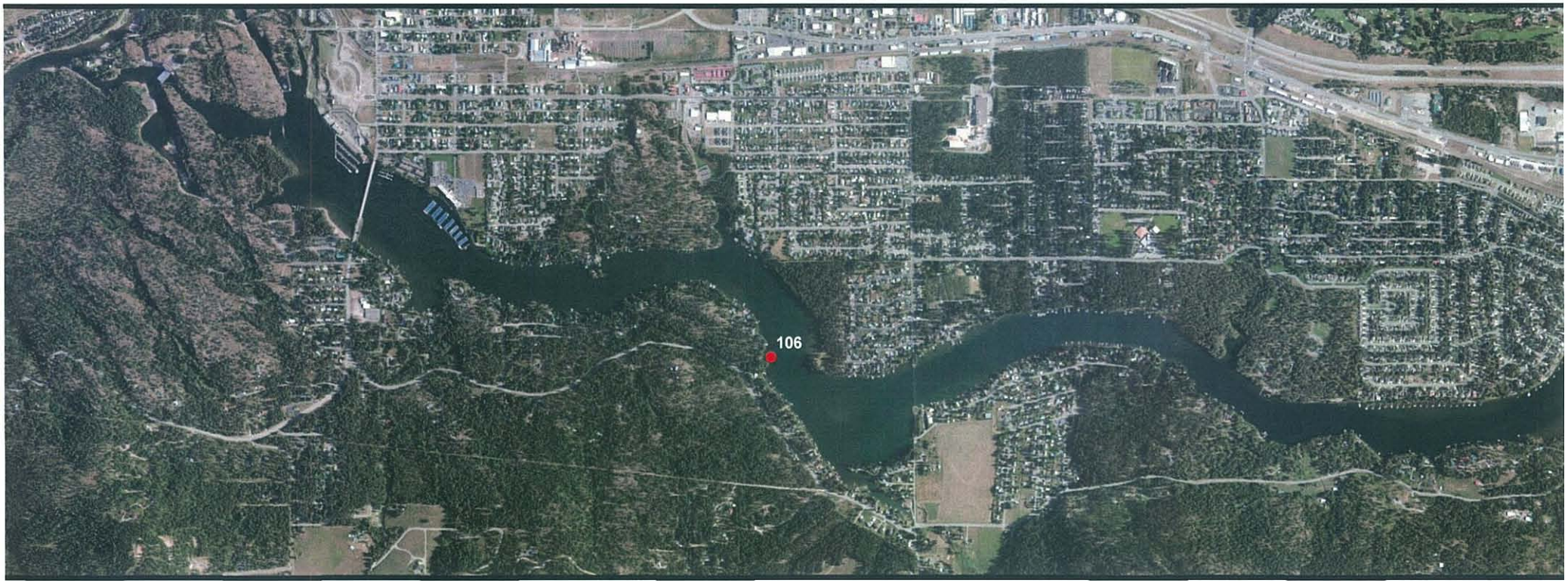
September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16, **2011**

0 0,15 0.3 0.6 Miles



Spokane River Survey 2011 - Avista Utilities

Leafy Pondweed Locations

September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 03 0.6 Miles

Spokane River Survey 2011 - Avista Utilities

Fan Wart Locations

September 19, 2011

N
W E
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Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 Miles

Spokane River Survey 2011 - Avista Utilities

Elodea Locations

September 19, 2011

N
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Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16,2011

0 0.15 0.3 0.6 Miles

Spokane River Survey 2011 - Avista Utilities

Big Leaf Pondweed Locations

September 19, 2011

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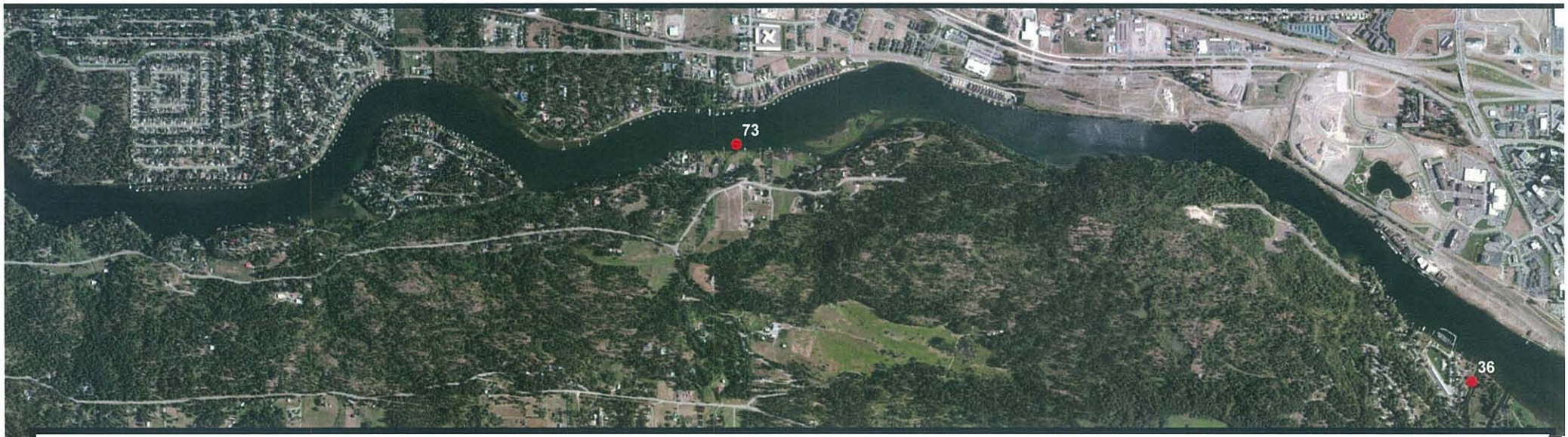
Universal Transverse Mercator - Zone 11N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 0.3 0.6 Miles



Spokane River Survey 2011 - Avista Utilities

American Pondweed Locations

September 19, 2011

N
W E
S

Universal Transverse Mercator - Zone 11 N
North American 1983 (mean for CONUS)

Map Date: November 16, 2011

0 0.15 03 0.6 Miles

APPENDIX C

COEUR D'ALENE LAKE MILFOIL HABITAT MAPPING

Lake Coeur d'Alene Aquatic Habitat Project

Prepared for Avista Corporation

AquaTechnex, LLC

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Bellingham WA, 98228
www.aquatechnex.com

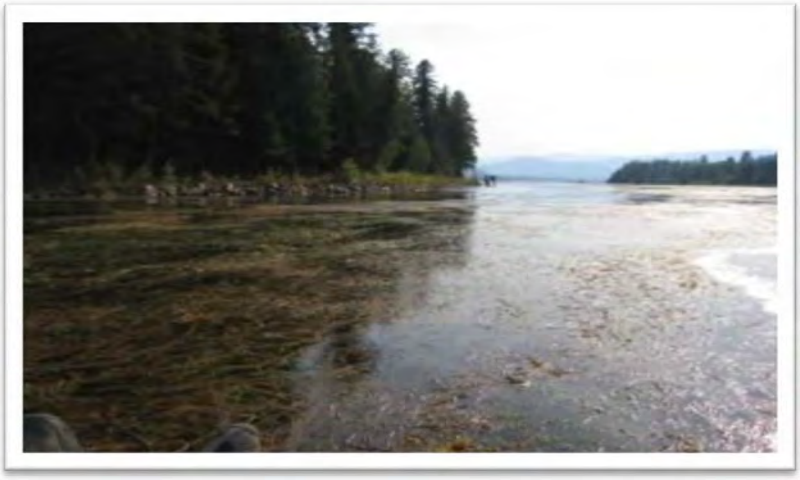
Appendix C

Introduction

On June 16, 2010, Avista Corporation filed the Lake Coeur d'Alene Aquatic Weed Management Plan for Non-Tribal Waters" with the Federal Energy Regulatory Commission (FERC). This plan was developed as part of relicensing hydro-electric facilities on the Spokane River. FREC approved the plan on January 19, 2011.

Aquatic vegetation is common in lake and river systems and is a critical component of the aquatic environment and food chain. Aquatic vegetation when present at excessive levels can however have a detrimental effect on many beneficial uses water managers are charged with preserving. Of particular concern are aquatic species that are not native to the region and aggressively expand and compete with native aquatic species. The Federal and State Governments have listed a number of species as harmful non-indigenous organism and have plans and programs to prevent there spread and manage them in infested waters. This plan is primarily focused on monitoring and managing invasive aquatic species.

Invasive aquatic species (IAS) are plants and animal organisms that have been introduced to the United States from foreign lands, and that once established in a waterbody cause significant damage. Aquatic weeds such as *Myriophyllum spicatum* and *Hydrilla verticillata* have had severe impacts on lake and river systems throughout the United States. These species out-compete native aquatic plant species forming monocultures where diverse communities used to exist. The dense aquatic growth once established impacts recreation. Weed beds impact the movement of boats, damage boat engines and pose a direct threat to the safety of swimmers. These beds also can dramatically alter water quality parameters critical to aquatic life, lowering pH and oxygen levels while leading to increased water temperature. Aquatic animals unintentionally introduced have had similar impacts. Zebra mussels were introduced to the Great Lakes through ballast water discharge in the 1980's and have caused severe damage to the ecology of the lakes. They have also spread throughout the river systems of the central United States and pose a severe threat to western water resources.



Eurasian Milfoil infestation on Lake Pend Oreille prior to treatment in 2006. Noxious aquatic weed growth chokes critical habitat. Early detection and management is a key part of protecting the ecology of a lake like Coeur d'Alene.

Lake Coeur d'Alene has been subject to the introduction of the invasive aquatic weed Eurasian Milfoil. The lake is also at risk of impact from other noxious aquatic weeds in the region that have not yet been

detected in the lake. The majority of the work on Eurasian Milfoil has been conducted by the Coeur d'Alene Tribe in the waters of the lake managed by the Tribe. Tribal biologists noted the presence of this invasive plant and have actively managed it in their waters since about 2005. Kootenai County and the Inland Empire Cooperative Weed Management Area has also played a role through monitoring and treatment of Eurasian Milfoil infestations in the Harrison Slough and the upstream chain of lakes.

The Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters is driven by the FERC licensing requirements. The license required Avista to complete the plan within one year of license issuance (June 18,2010) with the purpose to provide education, monitoring and control of aquatic noxious weeds. This plan has the following elements:

- Provisions to establish and expand aquatic noxious weed education programs
- A framework for annual monitoring to determine the distribution of aquatic noxious weeds
- Management strategies for control of aquatic noxious weeds

One of the key components of any successful management program is effective monitoring. The non-tribal waters on Lake Coeur d'Alene cover an extensive area. Effective survey of a lake system this size can be challenging and time consuming. There are over 100 miles of shoreline in the non-tribal waters of the lake. Section 2.3.2 of the Lake CDA Plan outlines the objectives of the monitoring program. The Plan states that "In general, habitat suitable for Eurasian watermilfoil includes un-shaded waters with a depth of less than 30 feet and muck, clay or silt substrates". One of the tasks required by Avista is to categorize lake substrates as High Priority suitable habitats, Moderate priority suitable habitats and Low priority suitable habitats. The plan requires that high priority habitats will be surveyed a minimum of once per three-year period. Moderate priority habitats will be surveyed a minimum of once per four- year period. Low priority habitats will be surveyed a minimum of once per five year period.

The plan's objective of establishing a framework for annual monitoring to determine the distribution of noxious aquatic weeds is addressed in this report. One of the issues facing Avista in the implementation of this Plan is that there has been no evaluation of the habitat conditions in non-tribal waters. In order to develop and implement the survey as required, maps needed to be created showing the location of each habitat type within the non-tribal waters of Lake Coeur d'Alene. With this information, Avista can focus survey efforts to meet the required schedule as set out in the plan.

Avista contracted with AquaTechnex, LLC to develop habitat priority maps to meet the needs of Plan Implementation. This report will provide an overview of the methods used to develop these maps and to provide the results of our habitat evaluations.

Objectives and methods

The objective of this mission was to develop accurate habitat maps that will be used in future aquatic noxious weed survey efforts as required by the Lake Coeur d'Alene Aquatic Weed Management Plan for Non-Tribal Waters. The primary considerations in classifying regions of the lake as high, moderate or

low priority are current aquatic plant growth present, proximity to public access sites, suitable water depth to support aquatic plant growth and substrate conditions suitable for aquatic plant propagation.

Our first step was to develop the Geographic Information System maps that will be used in the field and to report results to Avista. A project file was established in ArcGIS mapping software. We utilized a base background file of high resolution aerial imagery with transportation layers and political boundaries. This image data was accessed from ArcGIS online library.

Our team requested data from Avista with respect to bathymetry map layers available and from regional partners such as the Inland Empire Weed Cooperative Area to note previous survey efforts conducted on the lake.

Our first step in GIS analysis was to define areas of Lake Coeur d'Alene shallow enough to support aquatic plant growth. Avista bathymetry data was used to define these parameters. While the plan document indicates that aquatic plants can grow to depths of 30 feet; that generally does not happen in most lake systems. Water clarity limits light penetration necessary to support aquatic plant photosynthesis and growth. Water clarity is highly variable from lake to lake. Lakes that support algae blooms or with turbidity issues will generally not have aquatic plant life surviving much deeper than 6-10 feet. Extremely clear water bodies may see aquatic vascular plant growth living to depth of 20-30 feet. Aquatic vascular plants even in extremely clear water bodies are also limited by pressure with depth and generally do not survive much below 28 feet.

This image shows the littoral area contour established from bathymetry data provided. Areas in blue are too deep to support aquatic plant growth, areas between the edge of this polygon and the shoreline get enough light to support such growth if other conditions are favorable

After analyzing aquatic plant communities in the lake and reviewing the bathymetry data available to create a polygon, we selected the 2108 elevation layer. This was the deepest bathymetry polygon available in the data set for bathymetry provided. In addition, the bathymetry of Lake Coeur d'Alene is such that there are extremely steep drop offs along all shorelines in this range. The Plan suggests using the 30 foot contour. Aquatic plants do not root that deep in this lake and there is very little spatial

difference between the 20 and 30 foot contour levels because of the steep slopes underwater. If there is a 30 foot contour layer available elsewhere it can be added, but this would not significantly change the habitat maps developed for this survey.

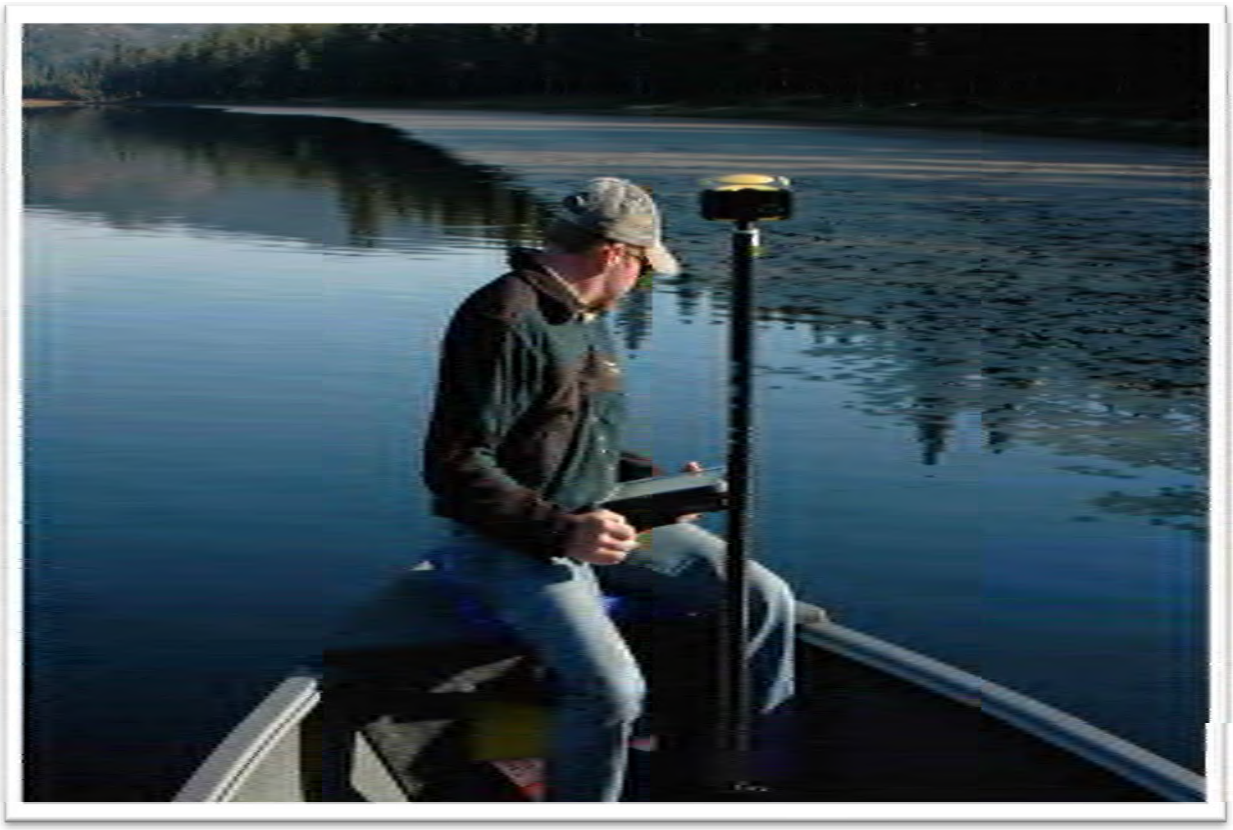
This elevation also matched aquatic plant growth limitations in the lake generally based on transect surveys conducted by our field team. This layer was selected and imported into the GIS project file as the first primary data set. The polygon was set to show the location of that contour and assigned a blue color scheme with 50% transparency over deeper waters. Areas that are shallower and indicate potential habitat were between this layer and the shoreline. With the areas of the lake defined that could support aquatic vegetation based on water clarity and light transmission, the survey phase of the mission began.

The first field mission was to perform an Aerial Shoreline Analysis (ASA) mission. ASA is a technology that was developed by AquaTechnex to image and map aquatic plant communities using remote sensing and GIS technologies. The technology involves the use of aircraft to collect high resolution low level oblique aerial imagery of the entire project littoral area. Flight protocols are developed to maximize water penetration and lighting conditions ideal to detect and map aquatic plant beds. A Nikon GPS camera is utilized to collect seamless imagery of the shoreline and littoral areas of the lake. The photography is shot to obtain a 30 percent overlap from image to image. Two flights from Spokane Geiger Field were performed in August during the maximum growth period of the aquatic plant communities. The morning flight was performed to image western and northern shoreline areas when sun angles were ideal. The afternoon flight was perform to image eastern shoreline area when sun angles were idea for that portion of the littoral areas of the lake.

This ASA image is typical of much of Lake Coeur d'Alene Shorelines. The imagery shows cobble substrate around the shoreline and island. Aquatic plant growth in the bay is also visible. This imagery can be viewed in zoom mode to get a clearer picture of conditions of interest.

In addition to imaging the Non-tribal waters for this project report, our team also imaged the Tribal waters of the lake and provided that imagery to the Tribe's Lake Manager.

Upon returning from the field, the image data and GPS location data was downloaded to the project file for this effort. Imagery was then reviewed to locate aquatic plant communities. These were digitized into ArcGIS and used for the field evaluation.



Aquatechnex biologists using ArcGIS and Trimble GPS equipment and software to confirm aquatic plant communities and update project files. This technique was used on this mission on Lake Coeur d'Alene.

The field data collection efforts took place in late August and September. Aquatechnex mapping vessels equipped with ArcGIS and Trimble DGPS data logging receivers mobilized to the lake and began the survey mission. The GPS units were set up with a data dictionary to collect point, line and polygon features for low priority, moderate priority and high priority. Aquatic plant and Eurasian Milfoil features were also available in the data loggers.

The boat survey work started near Blackrock and proceeded clockwise around the non-tribal areas of the lake. The contour data layer focused the team on the littoral area boundaries of the lake. The survey team travelled slowly through the littoral areas, recording habitat conditions as they went using DGPS receivers. They classified all of the littoral area as they moved along based on conditions present

with respect for suitability to support aquatic plant growth and the other factors noted in the Plan such as proximity to public access sites.

Much of the non-tribal waters of the lake are steep shorelines that drop off rapidly and with rock or large cobble substrates. These areas were completely free of any aquatic plant life, the substrate was such that rooted aquatic plants would not establish and had not established in the life of the lake. These areas were classified as low priority zones and mapped as either a line feature along narrow steep drop off areas along the shoreline or as polygons if larger areas were encountered with these conditions. The line feature was used on very narrow littoral bands so they would show up on maps effectively.

Portions of the lake littoral areas were found to support limited amounts of aquatic plant life. These areas were generally substrates that limited significant aquatic plant colonization, but had thin sediments that might allow some plants to establish. These areas were mapped as moderate potential or priority.

Many of the protected bay areas of the lake did support significant aquatic plant communities and as such would be habitat for Eurasian Milfoil if introduced and allowed to expand. The well protected bays in many cases had inflow streams that probably contributed to deposition of sediments eroded from the watershed. These areas were protected from scouring wave action. These areas were mapped as high priority zones for aquatic plant habitat.

The field efforts took approximately 9 field days to evaluate the aquatic habitat potential of the littoral areas of the lake and Spokane River between the lake and the Post Falls Hydro-Electric facilities.

On completion of the field efforts, the GPS data was downloaded and processes in Trimble Pathfinder software. This software performs differential correction to provide submeter accuracy to all collected features and then exported as ArcGIS shapefiles for analysis in that program.

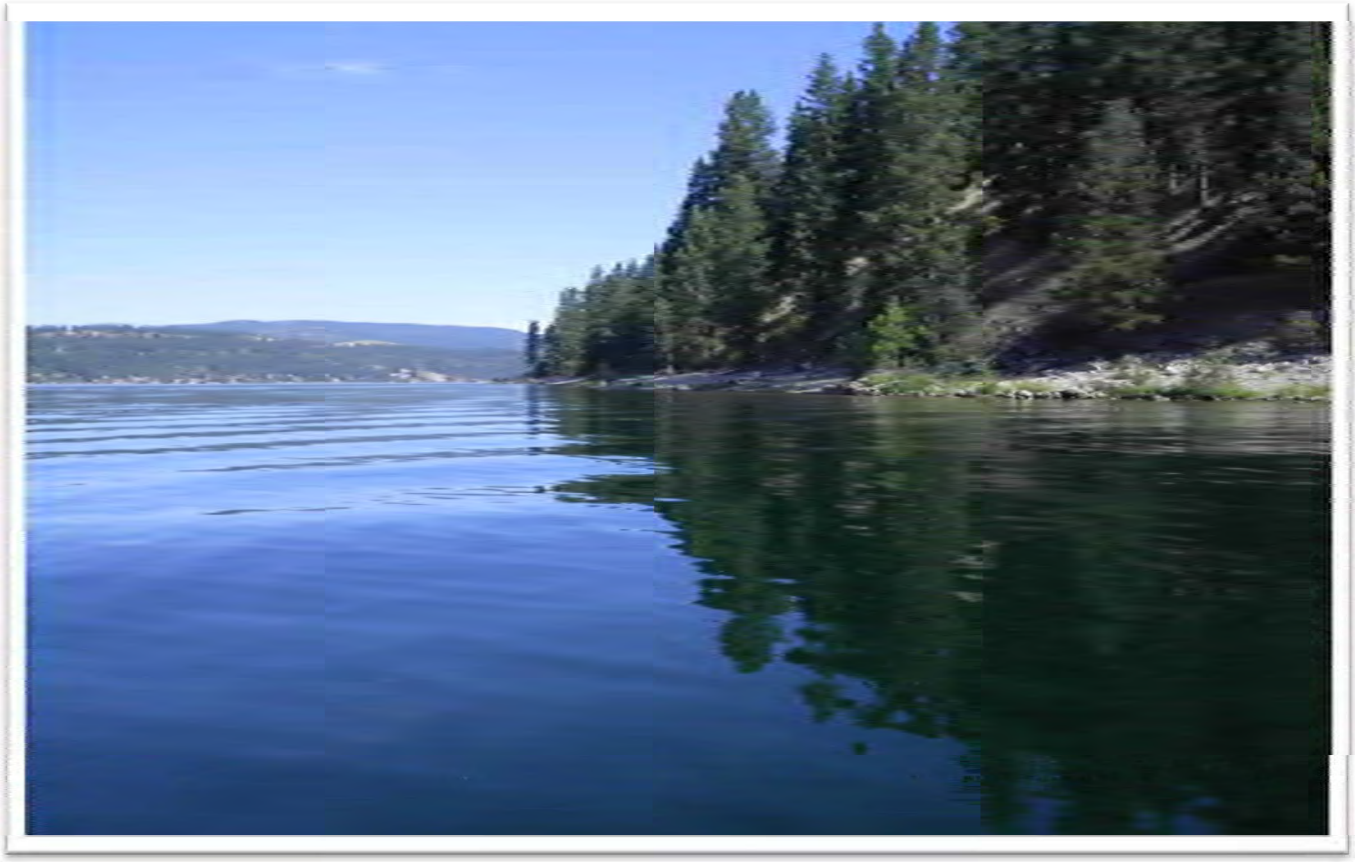
GIS analysis and map creation was the last step undertaken in this process. Exported GPS layers were added temporarily to display the results of the field mission. A geodatabase was created that had line and polygon features for the three conditions identified by the Lake CDA plan requirements. All littoral areas of the non-tribal areas of the lake were then classified by our team based on analysis of ASA imagery and field GPS records as one of the three conditions specified, High, Moderate or Low priority. Maps were then exported for use in the report and to provide to Avista.

Discussion of Findings

The results of this effort are shown in the attached map pages for the Non-Tribal Waters of Lake Coeur d'Alene. Some general observations are as follows.

The primary mission was to classify and map lake substrate based on the probability that areas would support Aquatic Invasive Species.

Low Priority Suitable Substrate- The vast majority of the shoreline in the non-tribal waters of Lake Coeur d'Alene are classified as low priority based on habitat conditions present. These areas have very steep drop off to water too deep to support aquatic weed growth. This limits the littoral zone that is shallow enough to allow for light penetration to a very narrow band along the shore. In addition, the vast majority of these areas had a lake substrate that would not be conducive to supporting aquatic plant growth. The lake bottom was solid rock, heavy large cobble rock substrate or very hard compact sediments. There was no observed evidence of aquatic plant life rooted in these areas. While it is possible that aquatic noxious weeds could establish in these areas, the probability of their success is low and these areas should not require survey at the same frequency as moderate and high priority areas. These areas are denoted on the maps as green lines or polygons in the Habitat Suitability Maps.

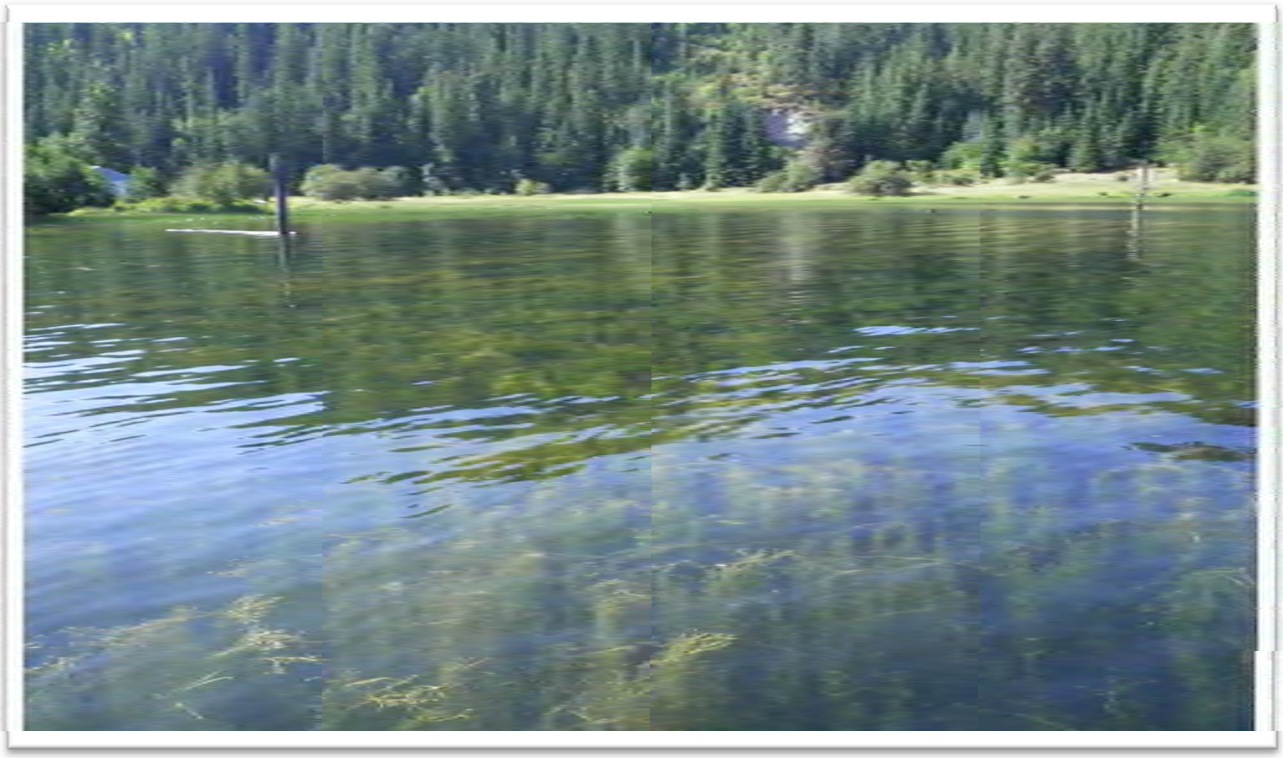


This shoreline is typical of the areas mapped as Low Priority Suitable Habitat. The boat in this image is sitting in over 100 feet of water close to the shoreline. The steep drop off limits the littoral area at these locations. The steep forested shorelines also limit light exposure during much of the day.

The other limiting factor in the Low Priority areas was bottom substrate. This image shows the typical large rock and cobble present throughout much of these zones. There is no substrate for aquatic plants to root and obtain nutrients required for growth.

Moderate Priority Suitable Habitat-Areas of the lake littoral area that had some evidence of aquatic plant colonization were inspected for substrates. Areas that supported limited growth of aquatic vegetation and had other factors such as very narrow littoral band, hard compact sediments or smaller rock cobble were classified after inspection as Moderate Priority Suitable Habitat. These areas are denoted on the maps a yellow lines or polygons in the Habitat Suitability Maps.

High Priority Suitable Habitat-Areas of the lake that exhibited conditions suitable to sustain aquatic plant growth and as such be extremely vulnerable to colonization by aquatic invasive species were classified as High Priority. These areas generally had very well established aquatic plant communities present already comprised of native aquatic species. In some limited cases we also discovered aquatic invasive species present and mapped them as well. The majority of the bays on the lake have inflow streams or creeks. Sediment deposit from eroded uplands in the delta areas of these bays provides excellent substrate for aquatic plant growth. The majority of the areas classified as High Priority are in protected bay and coves on the lake. These high priority areas are denoted as red lines or polygons in the Habitat Suitability Maps.



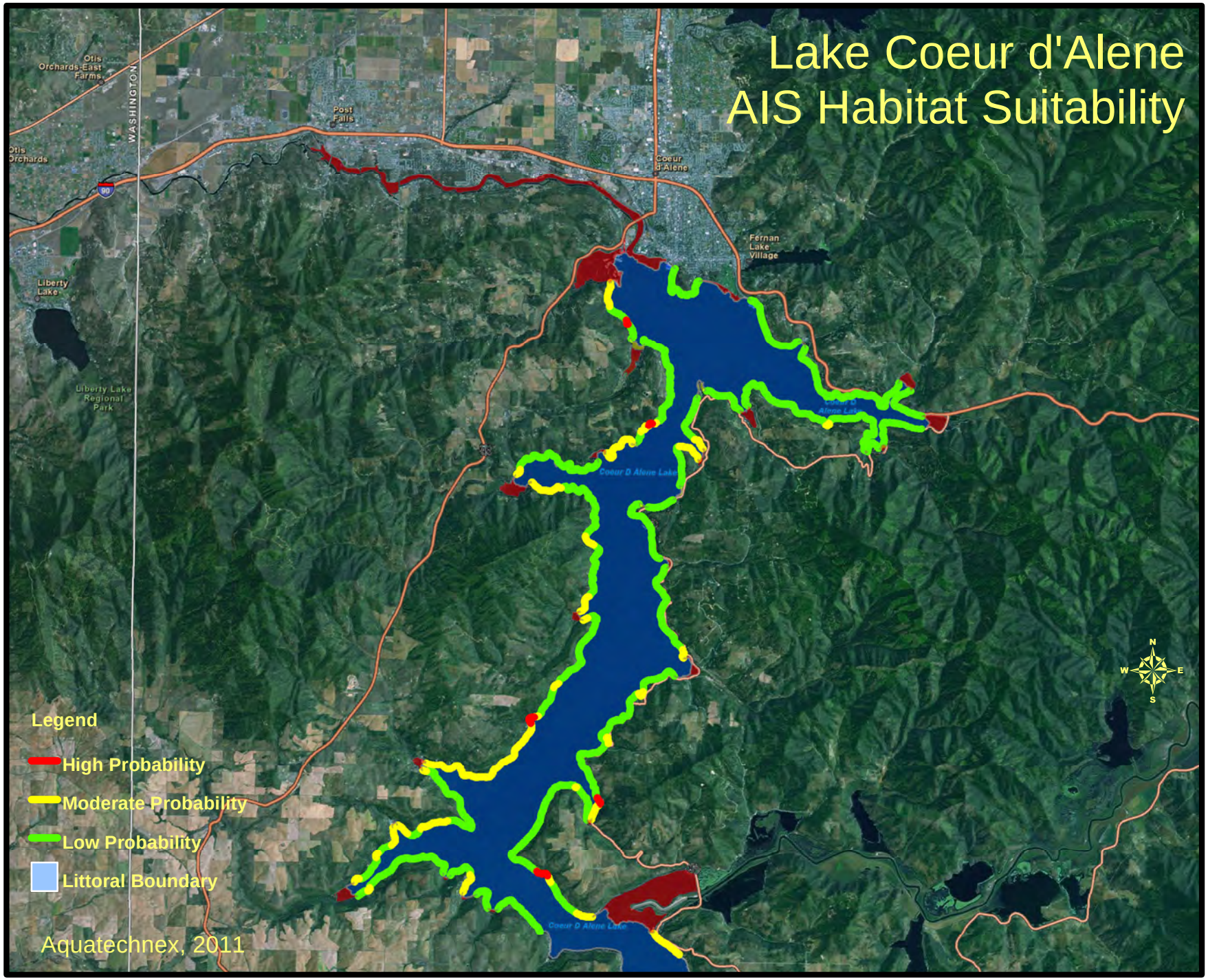
This locations is mapped as High Priority Suitability Habitat. The majority of the protected bays on the Non Tribal areas of the lake exhibited healthy stands of native aquatic plant growth. These areas are very susceptible to noxious aquatic weed growth if these plants are introduced. This is Powderhorn Bay on the eastern shoreline north of Harrison.

Map Pages-Habitat Suitability

The first map page provided for this category is the overview of the project area. This map shows all non-tribal waters and the classifications we assigned to areas capable of supporting aquatic vegetation. The features present are:

- Coeur d'Alene Tribe Reservation Boundary Projected into the lake, Orange Line
- Littoral Area Definition, Blue Polygon over waters too deep to support Aquatic Plant Growth
- Low Priority Habitat Suitability, green line or polygon
- Moderate Priority Habitat Suitability, yellow line or polygon
- High Priority Habitat Suitability, red line or polygon
- Background is high resolution World Imagery from ArcGIS Online

There is one overview map and a number of close up maps provided. Detailed examination can be performed by analysis of GIS files that are provided with this report as well.


Lake Coeur d'Alene
AIS Habitat Suitability
Otis Orchards-East Farms
Otis Orchards
WASHINGTON
Post Falls
Coeur d'Alene
Fernan Lake Village
Liberty Lake
Liberty Lake Regional Park
Coeur D Alene Lake
N
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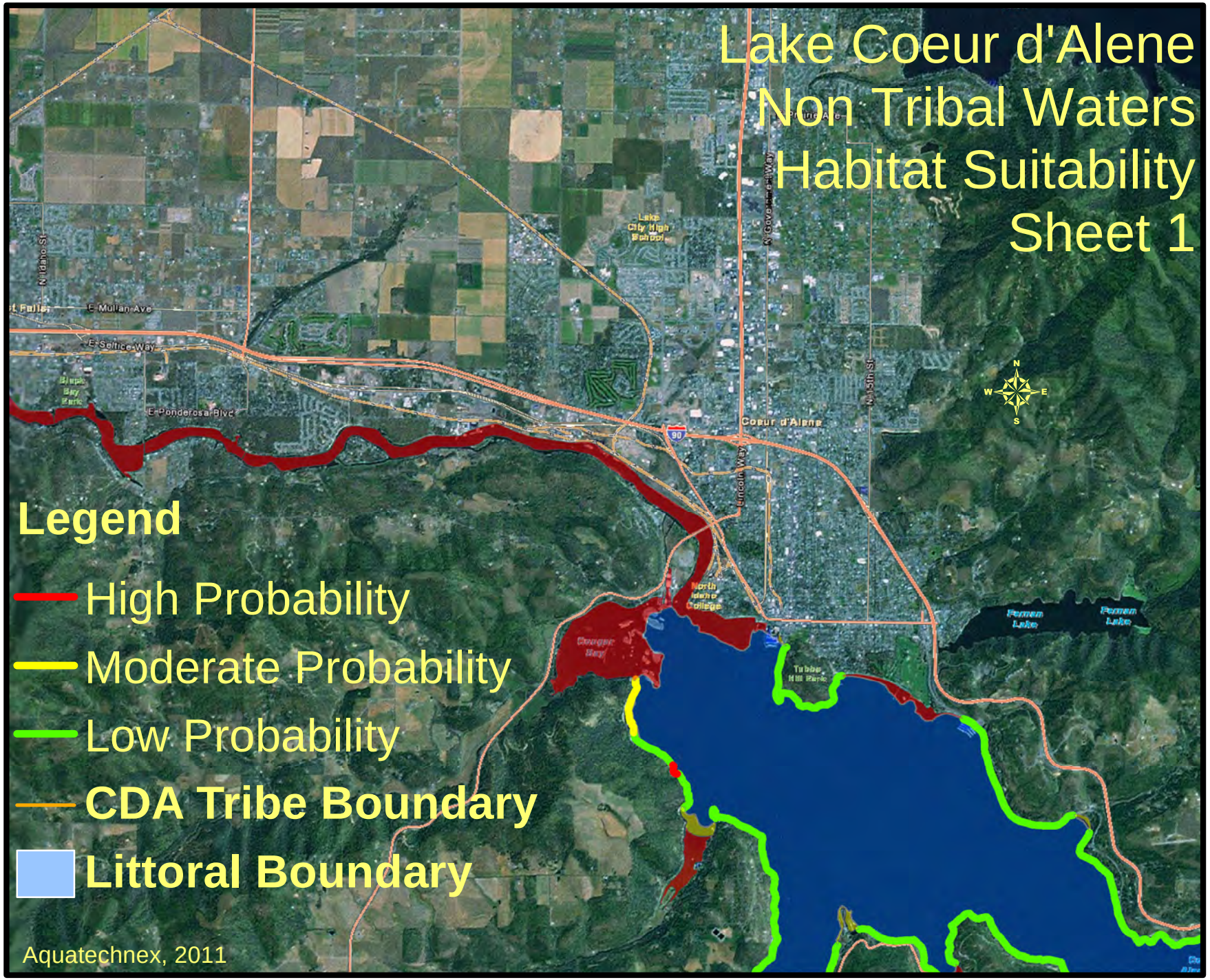
Legend
High Probability
Moderate Probability
Low Probability
Littoral Boundary
Aquatechnex, 2011

Appendix C


Lake Coeur d'Alene
Non Tribal Waters
Habitat Suitability
Sheet 1
Legend
High Probability
Moderate Probability
Low Probability
CDA Tribe Boundary
Littoral Boundary
Aquatechnex, 2011
N
S
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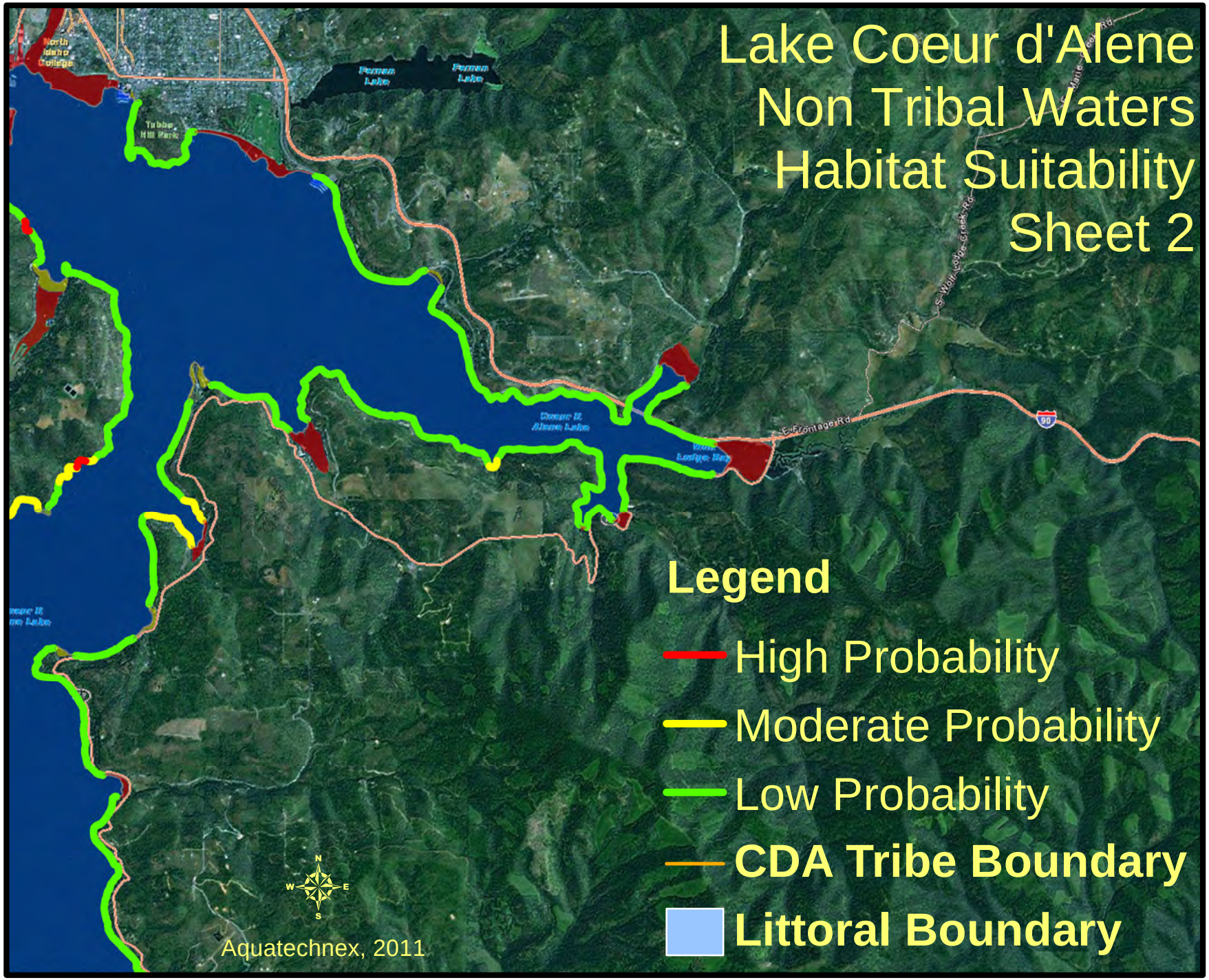
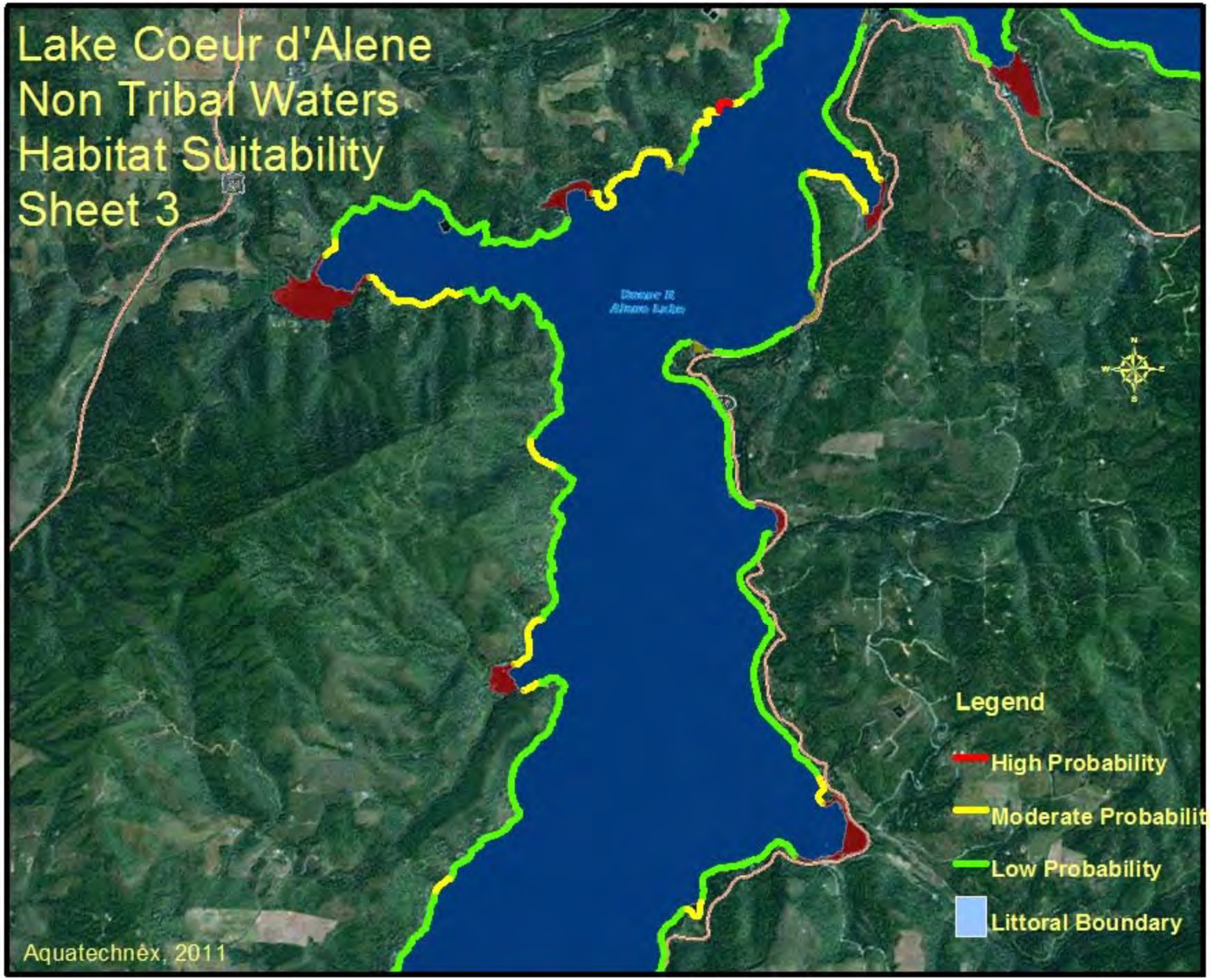
Coeur d'Alene
E Mullan Ave
E Seltice Way
E Ponderosa Blvd
N Idaho St
N 15th St
Lincoln Way
Fernan Lake
Tubbs Hill Park

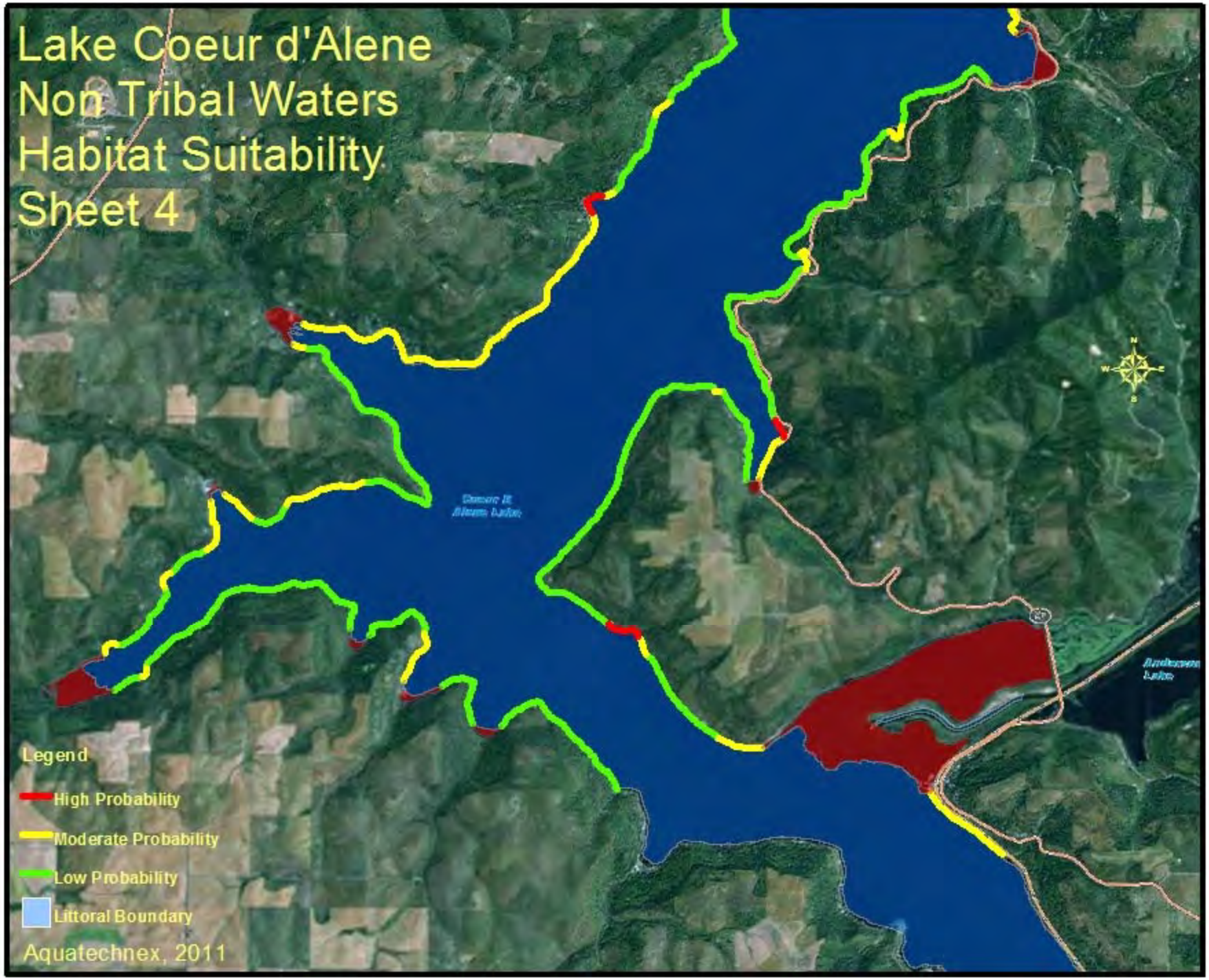
Appendix C


Lake Coeur d'Alene
Non Tribal Waters
Habitat Suitability
Sheet 2
Legend
High Probability
Moderate Probability
Low Probability
CDA Tribe Boundary
Littoral Boundary
Aquatechnex, 2011

Appendix C


Lake Coeur d'Alene
Non Tribal Waters
Habitat Suitability
Sheet 3
Legend
High Probability
Moderate Probabilit
Low Probability
Littoral Boundary
Aquatechnex, 2011

Appendix C


Lake Coeur d'Alene
Non Tribal Waters
Habitat Suitability
Sheet 4
Legend
High Probability
Moderate Probability
Low Probability
Littoral Boundary
Aquatechnex, 2011

Appendix C

Map Pages-Aquatic Vegetation Coverage of Littoral Areas

The first map provided for this category is an overview map of the project area. Four additional maps are provided with closer detail regarding conditions present. The features present on these maps are:

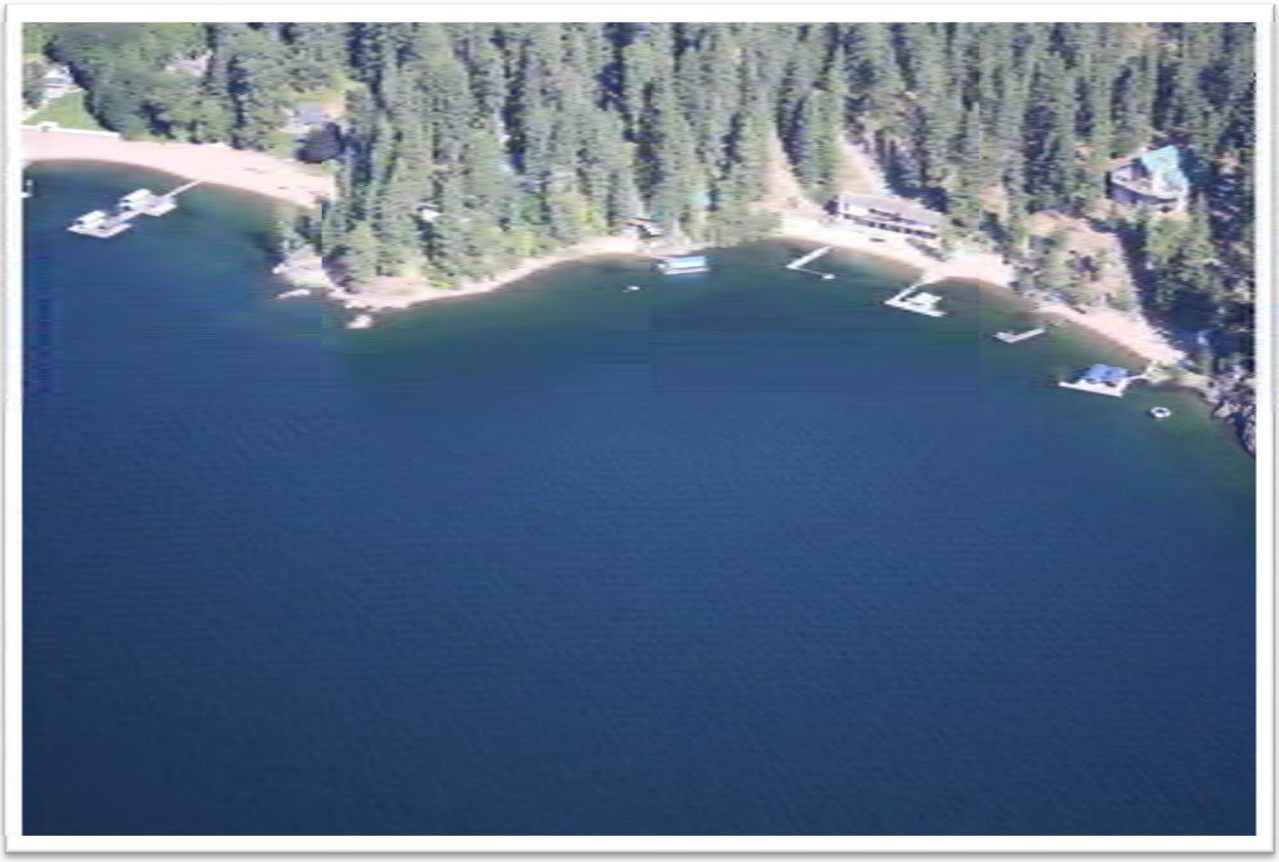
- Native Aquatic Plant Communities polygons
- Eurasian Milfoil points
- Coeur d'Alene Tribe Boundary (to define non tribal waters)
- Littoral area
- Background is high resolution imagery from ArcGIS Online

There are generally two conditions present in the non tribal waters of Lake Coeur d'Alene with respect to aquatic plant growth present.

The vast majority of the exposed shorelines of the lake have been ranked as Low Suitability Priority Habitat and as one would expect there is no aquatic plant life established n these areas.

This image is typical of shoreline conditions on Lake Coeur d'Alene in the project area. The near shore areas are free of vegetation and are rock or cobble substrates. The lake bottoms drop off very rapidly and the littoral shelf present is very limited.

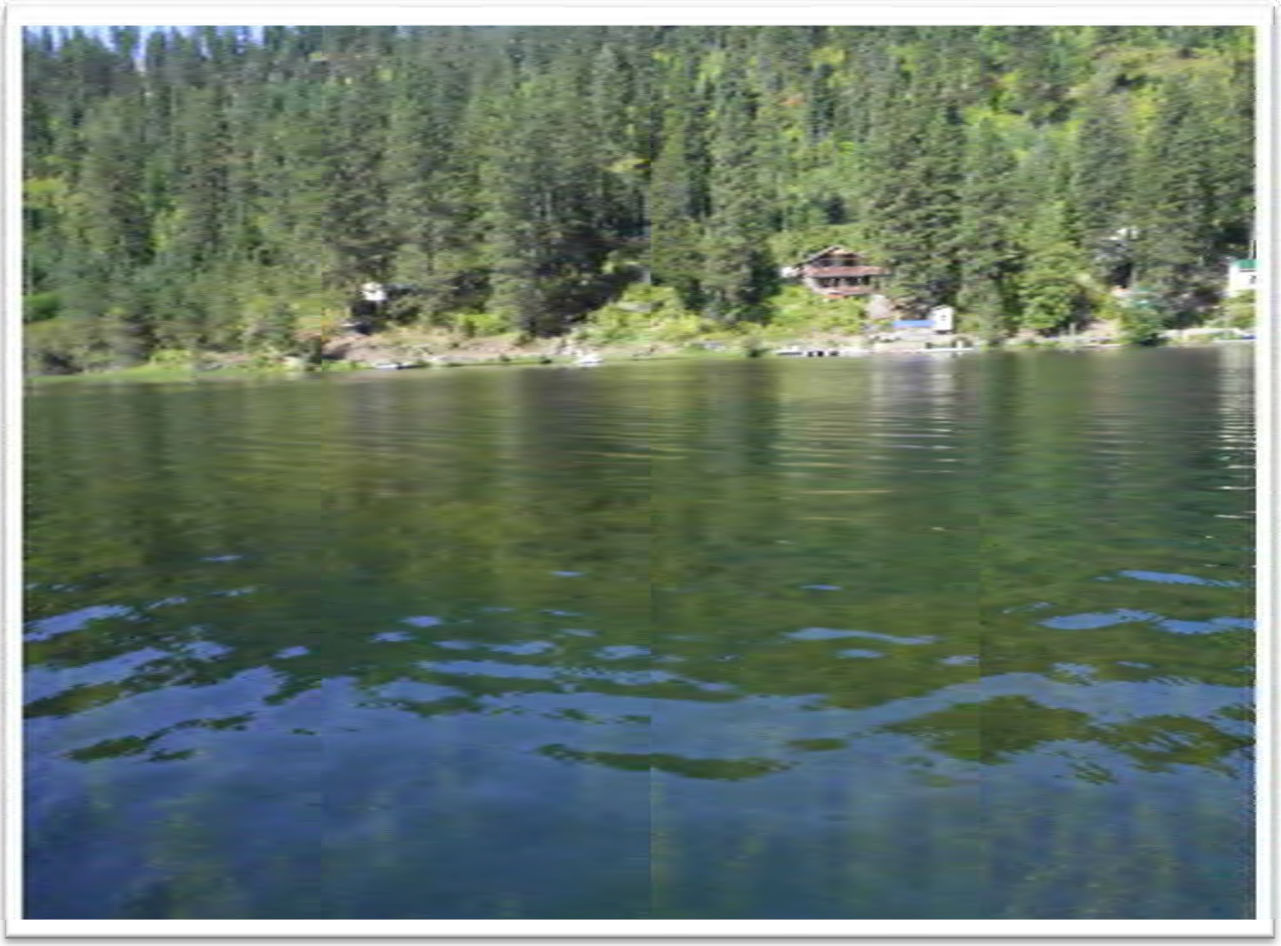
The coves and bays on the lake are sheltered and have different bottom substrates that are more conducive to establishment of aquatic plant growth.



This area is typical of smaller coves on the lake in the project area. An examination of the shoreline shows generally there are hard bottom or rock substrates. Also visible are very small aquatic plant colonies established under docks and in the very protected corners, but the majority of the littoral substrates remain clear of aquatic plant growth.

In the majority of the larger bays on the lake in non-tribal waters, there are very healthy aquatic plant communities established. The dominate species present are Potamogeton species. While each bay varied slightly, generally the aquatic plant communities were made up of Slender-Leafed Pondweed (*Potamogeton filiformis*), Leafy Pondweed (*Potamogeton foliosus*), Richardson's Pondweed (*Potamogeton richardsonii*) and Illinois Pondweed (*Potamogeton illinoensis*). There was generally an understory of lower growing species present in these communities as well. Common Waterweed (*Elodea canadensis*) and Small Pondweed *(Potamogeton pusillus*) were observed as well. While these were the dominant plants present in each case, a number of other species were observed in minor cases throughout the established aquatic plant communities.

The shorelines of these bays often were colonized by a variety of emergent vegetation and transitional wetland species. These emergent plant communities were absent from the exposed main shorelines of the lake.



This is typical of the aquatic plant communities observed in the protected bays around the non tribal waters on the lake. A mix of Potamogeton and Elodea species generally dominated these areas.

In the smaller coves and bay on the portions of the lake surveyed, this growth did not pose an impediment to recreational uses by the shoreline community. In the larger bays however, aquatic plant growth was such that there could be an impact on boating and swimming. While these plant communities were made up of native aquatic species, the density of these beds are such that they may interfere with some beneficial uses of the lake shoreline.

This scene is typical of the larger protected bays in the project area. Native aquatic plant growth is well established and in this case is causing issues for some beneficial uses such as boat navigation, note the trails from docks to deep water. This image also shows the transition between littoral area and deep water habitat where plant growth stops.

Noxious aquatic weed growth in the study area was found to be extremely limited at this point. The southern portion of Lake Coeur d'Alene in Tribal waters has considerably more littoral area present and there has been significant infestations of Eurasian Milfoil present for a number of years. The Tribe is actively managing these noxious weed communities with a focus on restoring native aquatic plant communities. Eurasian Milfoil is a species that spreads through fragmentation. The plant can be cut by boat traffic and the fragments can float to other areas of the lake where they can root and establish new colonies. This plant will also auto-fragment in the fall of the year. The plant stems sprout white root hairs and weaken. Wind and wave action can then break the plant apart and this dispersal mechanism spreads the plant as well.

With these large stands of this noxious weed present in the downstream portions of the lake, it might be expected that there would be extensive stands of this weed present in the littoral areas of non-tribal waters as well. Our team did not find that to be the case at this point in the life of this lake system.

We did note the presence of Eurasian Milfoil in Harrison Slough. This area however had been subject to a approximately 200 acre herbicide treatment targeting this species. As such, plants were damaged or may have fallen from the water column prior to our inspection of this zone. As such, we placed a number of Eurasian Milfoil symbols throughout this zone noting that this noxious weed was present at levels that required treatment and post treatment analysis in future years should be performed to determine the impact and note any remaining growth.

The only other location where our team noted Eurasian Milfoil were pioneering colonies present mixed in the native plant communities in Mica Bay. The majority of Mica Bay is too deep to support aquatic plant growth. In the back bay however there is a rich community of Potamogeton species. We noted a number of locations where individual or pioneering milfoil plants were present. This is typical of the invasion of an un-infested area by this species. The plant starts out as a very minor component of the aquatic plant community. As individual plants establish larger root crowns, they will put up many more stems from each established site. These stems grow much faster than native aquatic plants and reach the surface from much deeper locations. They then shade out the desirable species, establish more plants through fragmentation and over the course of a few years dominate the system.

Mica Bay is a location that should be the focus of preventative control measures. AquaTechnex can provide a management plan for this location for consideration if Avista desires that input.

Our team did not discover additional noxious aquatic weed species in this system. On a survey of this scale it is possible that individual plants may have been missed, but not probable.

Aquatic invasive animals such as Zebra and Quagga Mussels are also a cause for concern as the move west. These organisms colonize hard substrates and from our observations this lake system could provide excellent habitat for these species if water quality conditions are right. The rock and cobble lake bottoms that make the establishment of aquatic plant species problematic are ideal substrate for these species. Our team viewed miles of this substrate at slow speed during this survey. The water clarity is such that if established communities of these organisms were present, it is probable that we would have detected them. As these species move closer to this lake system, introduction is more of a threat.
While the Low Suitability Priority areas on the lake do not need to be survey at the same frequency as higher priority areas with respect to noxious aquatic weed growth, these areas probably have a high suitability for these other organism. Thought should be given to that during the planning of survey mission in the future.

As time goes by, the threat of introduction of new species or the further expansion of Eurasian Milfoil could be expected and the ongoing survey work is a critical component of the protection of this resource from these species.


Lake Coeur d'Alene
Aquatic Plant
Communities
Sheet 1
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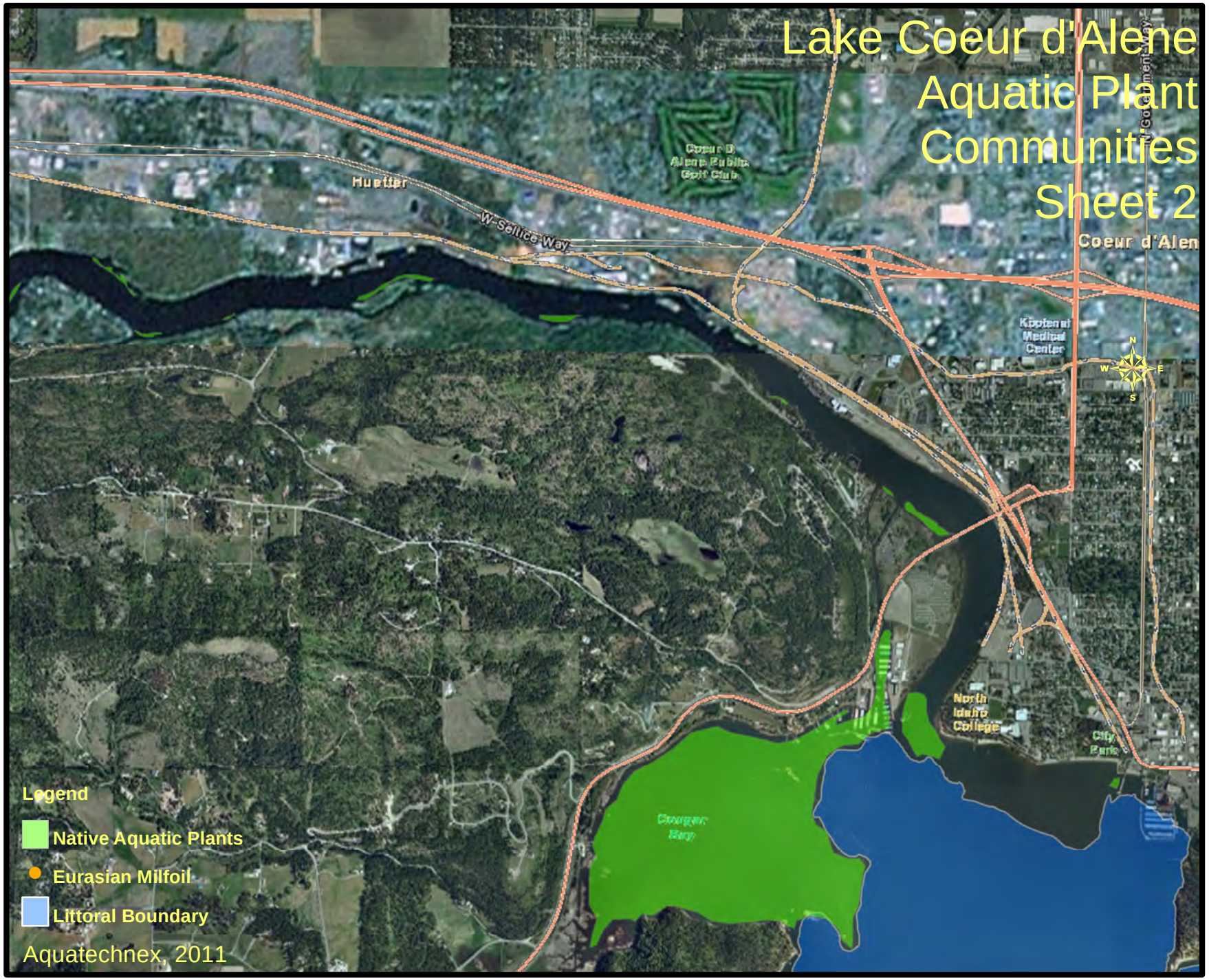
E Sellice Way
E Ponderosa Blvd
Spokane River
Q'emiln Park
Blank Bay Park
90
Legend
Native Aquatic Plants
Eurasian Milfoil
Littoral Boundary
Aquatechnex, 2011

Appendix C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Kootenai
Medical
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North
Idaho
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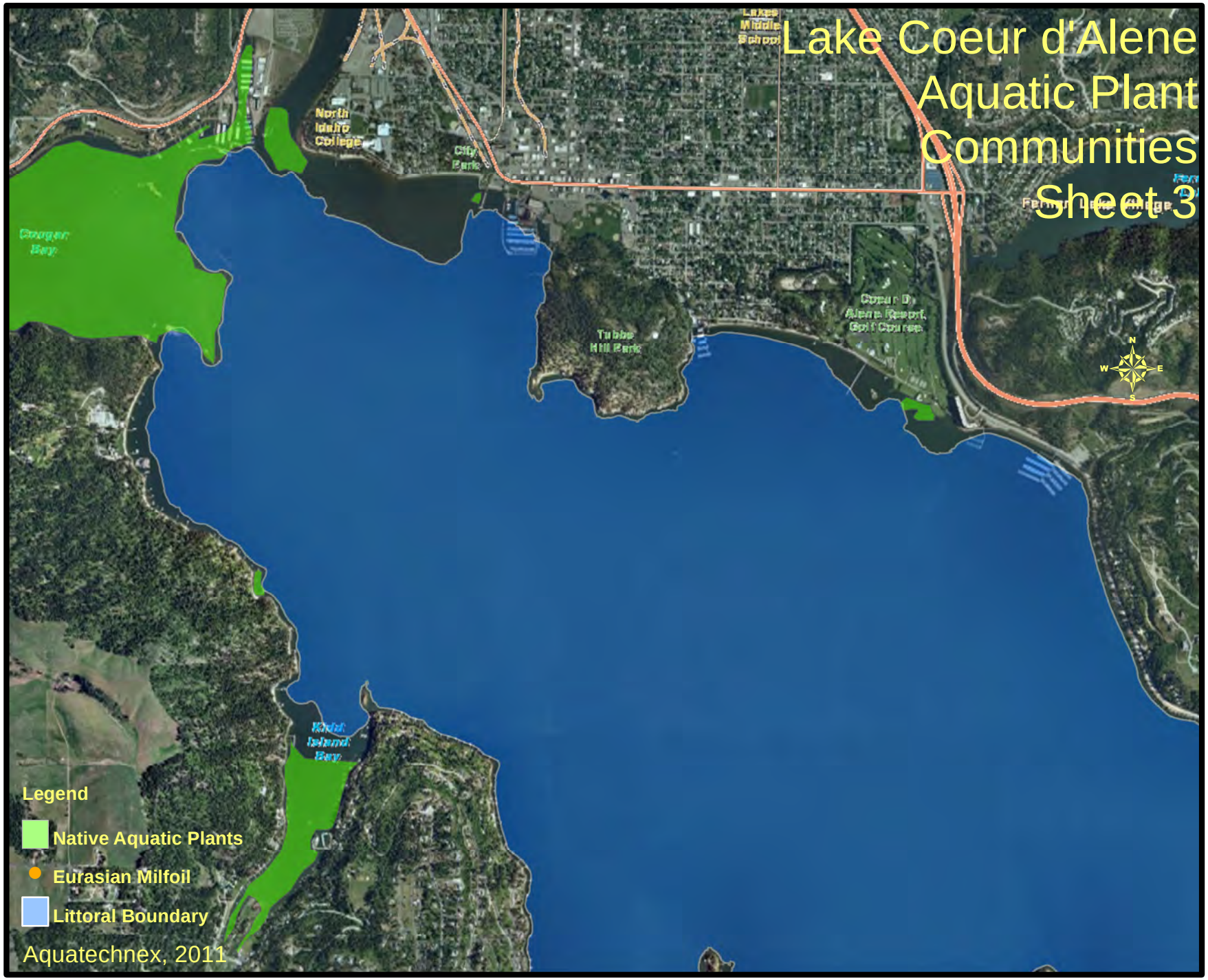
Park
Cougar
Bay
Legend
Native Aquatic Plants
Eurasian Milfoil
Littoral Boundary
Aquatechnex, 2011

Appendix C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Aquatic Plant
Communities
Sheet 3
North Idaho College
City Park
Cougar Bay
Tubbs Hill Park
Coeur D Alene Resort Golf Course
Kidd Island Bay
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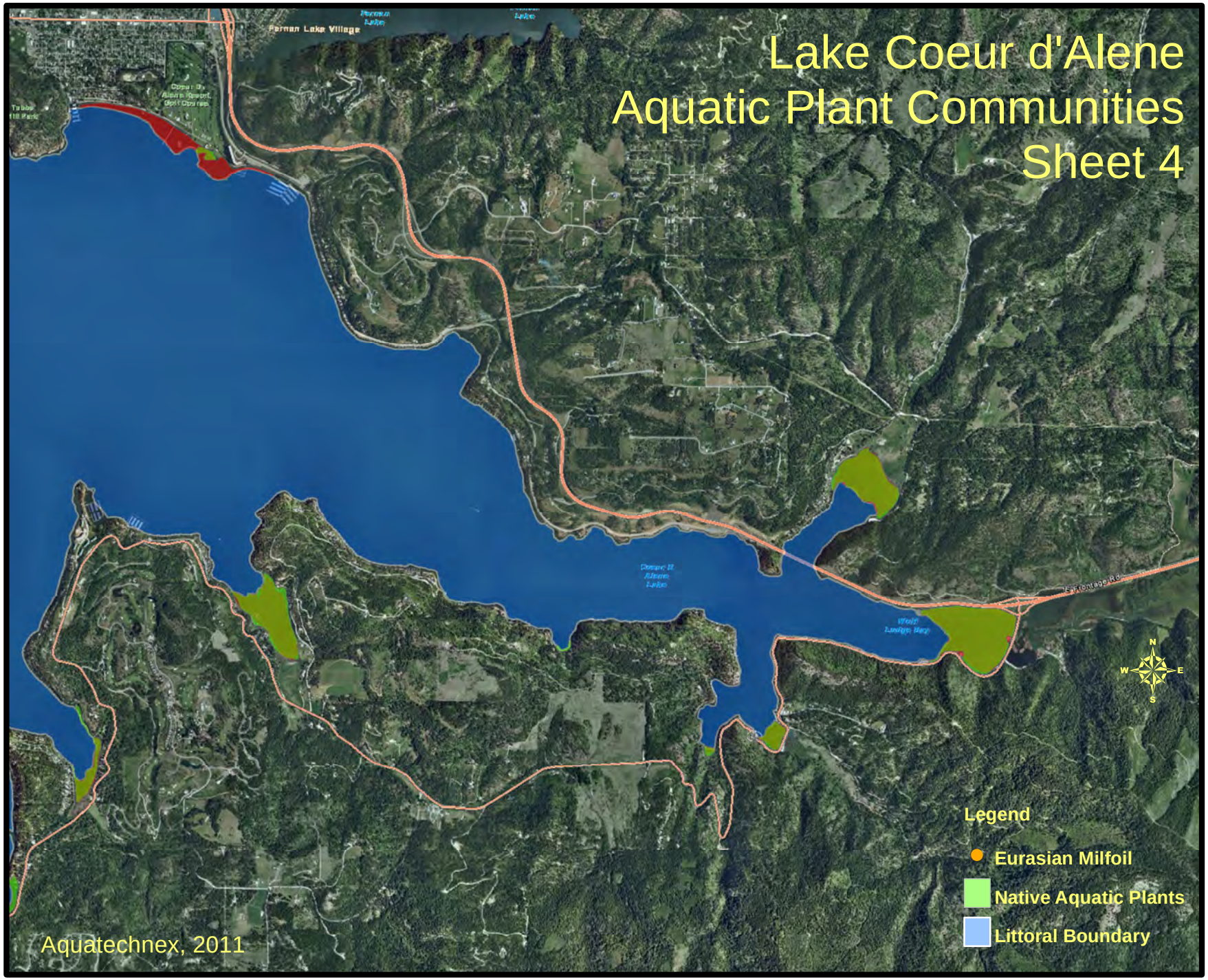
Legend
Native Aquatic Plants
Eurasian Milfoil
Littoral Boundary
Aquatechnex, 2011

Appendix C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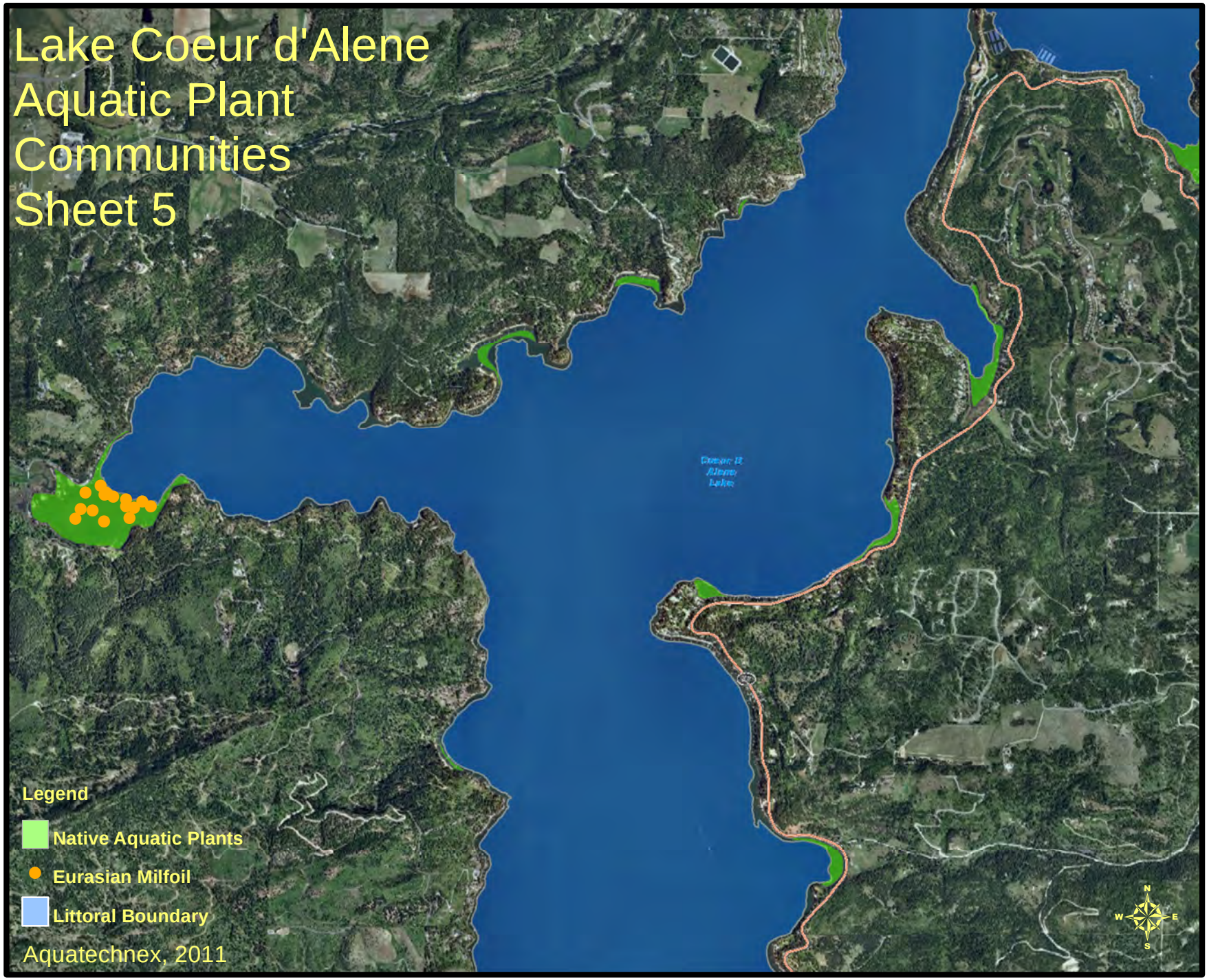
Appendix C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Aquatic Plant
Communities
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Native Aquatic Plants
Eurasian Milfoil
Littoral Boundary
Aquatechnex, 2011
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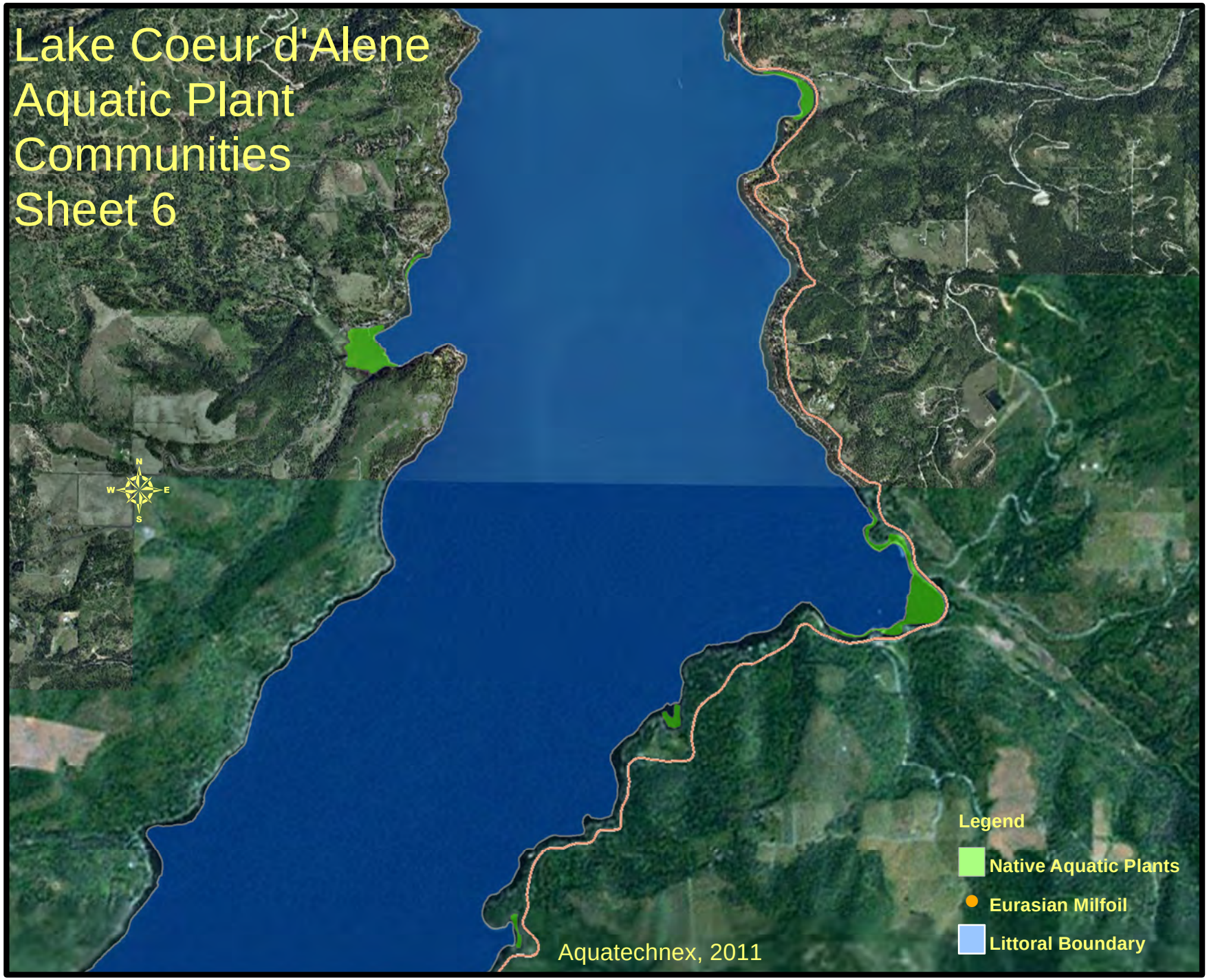
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Native Aquatic Plants
Eurasian Milfoil
Littoral Boundary
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Lake Coeur d'Alene
Aquatic Plant
Communities
Sheet 7
Rockford Bay
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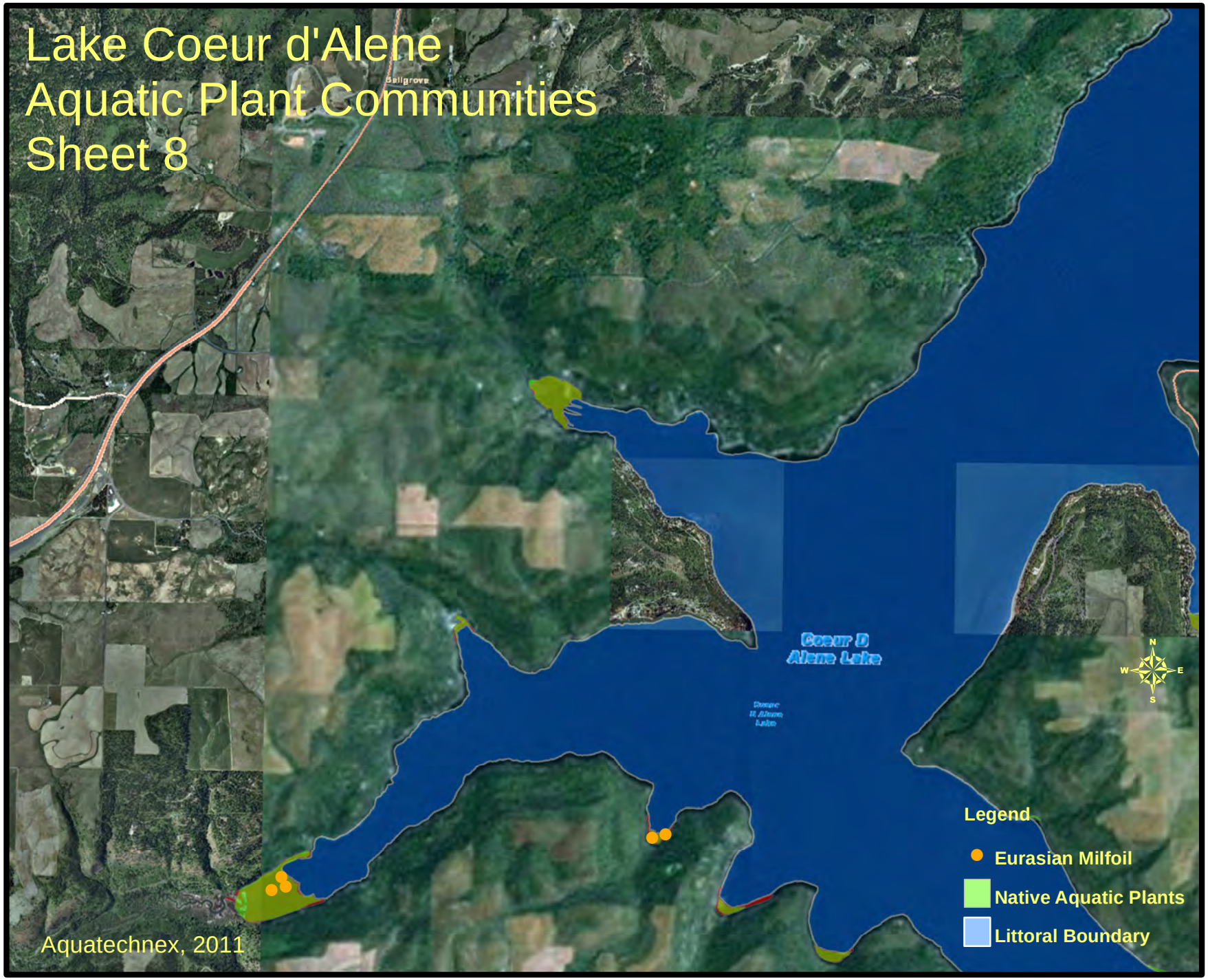
Legend
Native Aquatic Plants
Eurasian Milfoil
Littoral Boundary
Aquatechnex, 2011

Appendix C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Legend
Eurasian Milfoil
Native Aquatic Plants
Littoral Boundary
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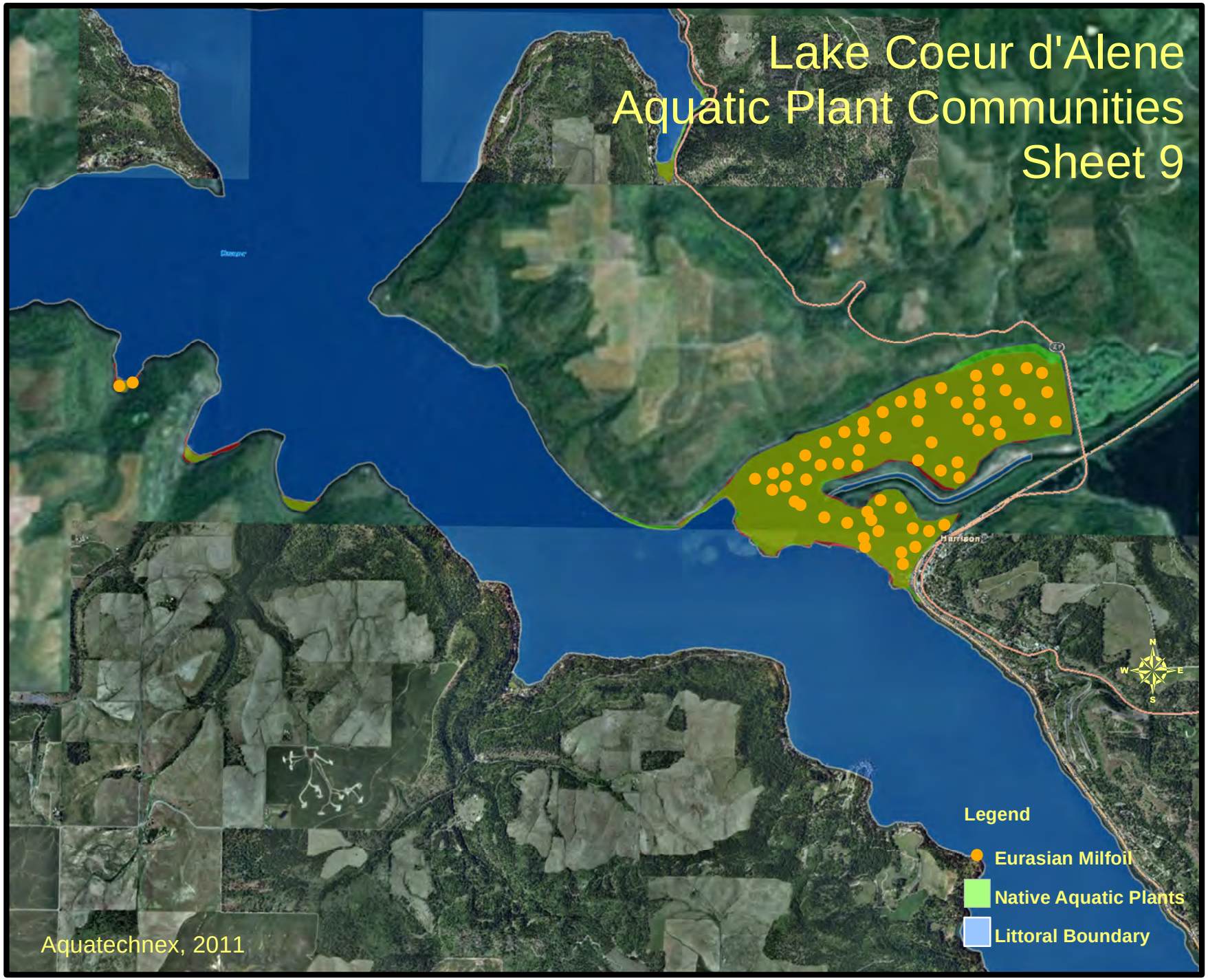
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Aquatic Plant Communities
Sheet 9
Harrison
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Legend
Eurasian Milfoil
Native Aquatic Plants
Littoral Boundary
Aquatechnex, 2011

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APPENDIX D

HERBICIDE TREATMENTS

Lakeland Restoration Services, LLC
78 E River Spur Rd, Priest River, ID 83856
Phone/Fax: (208) 448-2222
www.lakelandrs.com

2011 MILFOIL CONTROL PROJECT AT HARRISON SLOUGH KOOTENAI COUNTY, IDAHO

FINAL REPORT

Introduction

Lakeland Restoration Services, LLC (LRS) performed an herbicide treatment for Eurasian Watermilfoil, on Lake Coeur d"Alene in the area known as Harrison Slough August 30, 2011. The goals of this report are to describe the work performed by LRS before, during, and after treatment.

Project Preparation

In preparation for this project, Lakeland Restoration Services, LLC (LRS) performed the following pre-treatment procedures:

- An updated Certificate of Insurance was forwarded to Linda Ely, Kootenai County Weed Superintendent.
- LRS accompanied Linda, Bill Hargrave from Kootenai County Noxious Weed Control (KCNWC),an ISDA representative and John Selby with Cygnet during their pre-treatment survey as part of the LRS Aquatic Herbicide Treatment Project Initialization Protocol.
- Pre-treatment GIS layers were created and acreage calculated.
- Received approval from Linda on final acreage totals and herbicide amounts.
- Treatment Plan/Safety Plan completed and forwarded to Linda (attached – see Appendix A).
- Final checks complete for all equipment.
- Mobilization complete.

Public Notifications/Shoreline Posting

All public notifications were coordinated/performed by KCNWC. Shoreline notices providing a brief description of the project including project purpose; chemical used; any applicable water use restrictions; and the name and phone number of the project sponsor were generated by LRS and posted by LRS. Signs were posted adjacent to the treatment area(s) approximately every 200 feet along the shoreline of the treatment area or otherwise on trees or docks adjacent to the water body's treatment area. Signs were also posted at public access points around the water body.

Product Delivery/Distribution

Kootenai County supplied the herbicide for this project from a bid with Wilbur Ellis.

Treatment Areas/Product Information

The following table outlines the amount of Weedestroy and (Active Ingredient: 2,4Dichlorophenoxyacetic acid, dimethylamine, EPA Reg. No. 228-145) that was applied by treatment area (treatment maps attached – see Appendix B):

Harrison Slough 2011 Chemical Inventory: Weedestroy

Site Name	Acres	Mean Depth Feet	Acre Feet	Gallons Chem (Rate = 2.0 [2.3 gal/acre ft])	Actual PPM Acheived§
1	10.00	4.0	40.00	92.00	2.5
2	10.50	3.0	31.50	72.45	2.5
3	10.80	3.0	32.40	74.52	2.5
4	10.10	3.0	30.30	69.69	2.5
5	9.40	4.0	37.60	86.48	2.5
6	10.60	4.0	42.40	97.52	2.5
7	10.00	4.0	40.00	92.00	2.5
8	10.60	5.0	53.00	121.90	2.5
9	9.90	4.0	39.60	91.08	2.5
10	11.10	5.0	55.50	127.65	2.5
11	10.90	5.0	54.50	125.35	2.5
12	10.50	5.0	52.50	120.75	2.5
13	10.80	4.0	43.20	99.36	2.5
14	11.00	4.0	44.00	101.20	2.5
15	10.70	3.0	32.10	73.83	2.5
16	10.60	3.0	31.80	73.14	2.5
17	10.70	4.0	42.80	98.44	2.5
18	10.90	4.0	43.60	100.28	2.5
19	9.30	4.0	37.20	85.56	2.5
20	8.00	3.0	24.00	55.20	2.5
21*	54.00	4.0	216.00	496.80	2.5
Totals:	260.40		1024.00	2355.20	

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± Changes in acreage or product occurred due to surface vegetation, wildlife, or mapping discrepancies. Constant communication was maintained with the Project Manager throughout the application for approval of changes.

† Total acres treated were determined by encompassing treatment tracks. This process was accomplished by importing tracks recorded during the application process using GPS technology into ESRI ArcMap 10.0 GIS.

§ Actual PPM achieved was calculated using the following formula: Actual Weedestroy used (gallons) ÷ the total of: Average Depth x Total Treated Acres x .905.

* Area 21 added at time of treatment.

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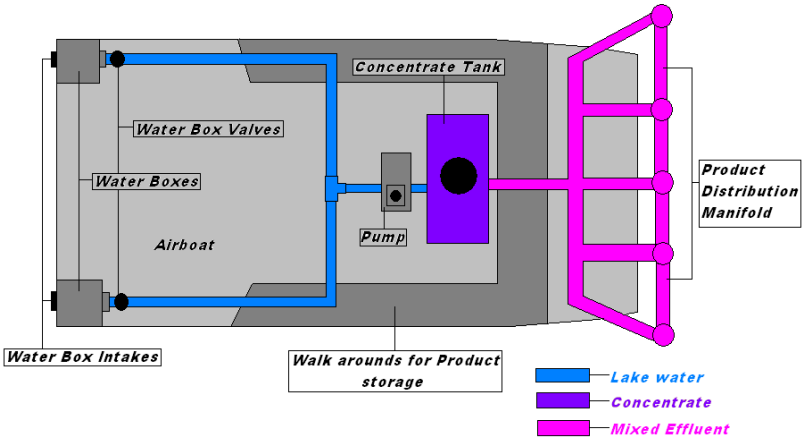
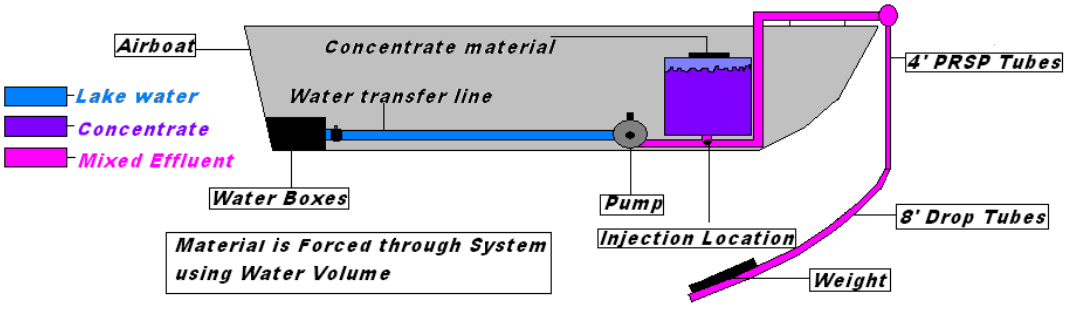
Treatment Methods

The application of Weedestroy was accomplished using 1 airboat using the following methodology:

Herbicide was applied using a manifold boom style sub-surface injection system that is attached to the airboat (pictures at right/diagram below). The collection side of the system gathers lake water from built in water boxes at the rear of the boat using a high volume, close tolerance pump powered by a 5hp Honda motor. The pump generates pressure through a manifold system causing a venturi effect, which pulls the concentrate from the tank, thereby mixing it with the lake water to be injected directly into the water column through the manifold boom. The boom is 8' wide and has 5 drop tubes, each 4' long.

Diagram A-1: Liquid Injection System – top/side view





The concentrated herbicide was continually poured from each 2.5 gallon container into a 25 gallon tank insuring a consistent application. Each container was triple-rinsed in the treatment area during the treatment, rendered incapable of reuse, and presented to the Kootenai County Noxious Weed Control office for recycling.

Personnel

The following personnel were present for this project:

- David L. Kluttz – license #41977 – Applicator/Airboat Pilot
- Steve McClain – license #49627 – Mixer/Loader
- Catherine Allen – Mixer/Loader Cert. – Mixer/Loader
- Jake Nesbit - Mixer/Loader Cert. – Mixer/Loader
- Natasha Nesbitt – Systems Manager - GIS/GPS

Personnel and Equipment

The following personnel and equipment was used for this project:

- 16-foot Airboat with 364 ci 550-hp motor capable of carrying 2,500-lb payload
- 16-foot Airboat with 364 ci 500-hp motor capable of carrying 2,000-lb payload
- 20-foot Hewescraft with 130-hp Honda motor, capable of 1,800-lb payload
- Liquid injection system with 25-gallon tank and five 4-foot subsurface injection nozzles
- Garmin GPS equipment used to plot and track treatments
- ESRI ArcMap 10.0 GIS to provide a means to map treatment areas, analyze results, and provide ArcGIS compatible shapefiles
- GEHL Skid Steer for moving pallets of herbicide product
- 18-foot tractor trailer for moving product
- 2008 Ford F350 used to haul equipment
- 1996 Dodge Ram used to haul equipment and supplies

Logs, Maps, and Tracking

The entire treatment was monitored with the use of Global Positioning System (GPS) technology. Treatment routes were pre-planned using ESRI ArcMap 10.0 GIS, and pre-loaded into 2 GPS devices.

After the treatment, tracks were downloaded into ESRI ArcMap 10.0 GIS, and analyzed for thoroughness of the treatment. Treatment area and treatment track maps were forwarded to Linda Ely.

An ISDA approved Herbicide Application Log was completed for the project as required (attached – see Appendix C). This record will be retained for 7 years with the project file.

Environmental Protection Measures/Safety Equipment

In order to minimize spills, herbicide was manually loaded directly into a nurse boat from its on-shore storage location. The nurse boat delivered the product directly to the application boat, which remained in the treatment areas throughout the day. Herbicide was inventoried each time it was loaded onto the application boat to insure the correct amount of herbicide was applied to each area. Empty containers and bags were retrieved and taken to a landfill or presented to the Kootenai County Noxious Weed Office for recycling.

Personal Protection Equipment was provided to workers, as per the herbicide label information, and a spill kit and absorption materials were available near the loading site and with the boat to be used in the unlikely event of a spill. A copy of the project's ***Safety Plan*** was provided to Linda Ely as part of the Treatment Plan.

Budget

The following table shows the final budget for the project:

TASK	QTY.	PRICE	TOTAL PRICE
PRE-TREATMENT SURVEY			**$3,250.00**
POSTING			**800.00**
APPLICATION HERBICIDE			
TREATMENT 260 ACRES			**24,900.00**
2,4 – D	**360 GAL.**	**14.50**	**5,220.00**
MATERIAL HANDLING			**5,200.00**
MOBILIZATION & DE-MOBILIZATION			**2,500.00**
FINAL REPORT			**925.00**
		TOTAL	**$42,795.00**

Application Summary

The initial survey conducted by KCNWC and ISDA revealed approximately 260 acres of Eurasian Watermilfoil (map attached – see Appendix D).

Chuck Hawley, Senior Agricultural Investigator with the Idaho State Department of Agriculture performed a pre-treatment inspection prior to the application.

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APPENDIX A – SAFETY PLAN

Lakeland Restoration Services, LLC
78 E River Spur Rd, Priest River, ID 83856
Phone/Fax: (208) 448-2222
www.lakelandrs.com

Harrison Slough, Kootenai County

EURASIAN WATERMILFOIL TREATMENT
SITE SPECIFIC SAFETY PLAN
Treatment Beginning August 30, 2011

Appendix D

Table of Contents

1.0 ORGANIZATIONAL STRUCTURE

(in compliance with 29 CFR 1910.120(b)(2))

This chapter of the Health and Safety Plan describes lines of authority, responsibility, and communication as they pertain to health and safety functions at this site. The purpose of this chapter is to identify the personnel who impact the development and implementation of the site health and safety plan and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations, and establishes the lines of communication among them for safety and health matters.

The organizational structure of this site's safety and health program is consistent with OSHA requirements in 29 CFR 1910.120(b)(2) and provides the following site-specific information:

* the general supervisor who has the responsibility and authority to direct all hazardous waste operations
* the site safety and health officer who has the responsibility and authority to develop and implement this HASP and verify compliance
* other personnel needed for hazardous waste operations and emergency response and their general functions and responsibilities
* the lines of authority, responsibility, and communication for safety and health functions

This section is reviewed and updated as necessary to reflect the current organizational structure at this site.

1.1 Roles and Responsibilities

All personnel and visitors on this site must comply with the requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs. A site organizational chart illustrating the hierarchy of personnel and lines of communication within this company and with additional contractors on site is found in Figure 1-1.

Project Manager (PM)

The Project Manager (PM) for this site is David Kluttz. The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Safety and Health Officer (SSHO), has the authority to oversee and monitor the performance of the SSHO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

Preparing and coordinating the site work plan; providing site supervisor(s) with work assignments and overseeing their performance; coordinating safety and health efforts with the SSHO; ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC); serving as primary site liaison with public agencies and officials and site contractors.

The qualified alternate Project Manager (PM) for this site is Steve Mclaine.

Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) for this site is Cathy Allen. The SSHO has full responsibility and authority to develop and implement this HASP and to verify compliance. The SSHO reports to the Project Manager. The SSHO is on site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

Managing the safety and health functions on this site; serving as the site's point of contact for safety and health matters; ensuring site monitoring, worker training, and effective selection and use of PPE; assessing site conditions for unsafe acts and conditions and providing corrective action; assisting the preparation and review of this HASP; maintaining effective safety and health records as described in this HASP; coordinating with the Emergency Response Coordinator (ERC), Site Supervisor(s), and others as necessary for safety and health efforts.

The qualified alternate Site Safety and Health Officer (SSHO) for this site is Jacob Nesbitt.

Emergency Response Coordinator (ERC)

The Emergency Response Coordinator (ERC) for this site is David Kluttz. The ERC is responsible for assessing site conditions and directing and controlling emergency response activities in accordance with the Site Emergency Response Plan. The ERC reports to the Project Manager (PM). The ERC will ensure the evacuation, emergency transport, and treatment of site personnel and will notify the appropriate emergency response units and management staff in accordance with the emergency response plan of this HASP. Specific duties of the ERC include:

Developing and reviewing the emergency response plan; conducting emergency response rehearsals; ensuring effective emergency response to and evacuation of the site; coordinating emergency response functions with the Site Safety and Health Officer (SSHO), and integrating site emergency response plans with the disaster, fire, and/or emergency response plans of local, state, and federal organizations and agencies.

The qualified alternate Emergency Response Coordinator (ERC) for this site is Cathy Allen.

The qualified second alternate Emergency Response Coordinator (ERC) for this site is Steve Mclaine.

Site Workers

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the work and safety and health instructions of the Project Manager (PM), Site Safety and Health Officer (SSHO), and Site Supervisor.

1.2 Identification of Other Site Contractors

There are no other contractors or subcontractors on this site.

2.0 JOB HAZARD ANALYSIS

(in compliance with 29 CFR 1910.120(b)(4)(ii)(A),and 1910.120(i))

This chapter of the HASP describes the safety and health hazards associated with site work and the control measures selected to protect workers. The purpose of a job hazard analysis (JHA) is to identify and quantify the health and safety hazards associated with each site task and operation, and to evaluate the risks to workers. Using this information, appropriate control methods are selected to eliminate the identified risks if possible, or to effectively control them. The control methods are documented in each task-specific JHA. The information contained in this chapter is essential to effective preparation of all other chapters of the HASP. This section of the HASP includes:

* job hazard analysis
* hazardous substance information
* employee notification of hazards

The person responsible for ongoing job hazard analysis at this site David Kluttz.

2.1 Job Hazard Analysis

Each site-specific JHA appears on a separate copy of Table 2-1. Each JHA lists a task or operation required during site operations and the location(s) where that task or operation is performed. A single JHA may be used for a task/operation performed in multiple locations if the hazards, potential exposures, and controls are the same in each location.

Each JHA lists the chemical hazards associated with that task and their known or anticipated concentrations during performance of the task. Each JHA also identifies anticipated physical and biological hazards and potential exposure levels or the likelihood of exposure. The final section of each JHA lists the control measures implemented toprotect employees from exposure to the identified hazards. The information provided here is designed to satisfy the job hazard analysis requirements of 1910.120(b)(4)(ii)(A) and the workplace hazard assessment requirements of 1910.132(d). Health hazard information for all chemical substance identified in site JHAs appears in hazard data sheets attached to this chapter.

Natasha Nesbitt modifies site-specific JHAs and the accompanying data sheets when:

* the scope of work is changed by adding, eliminating, or modifying tasks
* new methods of performing site tasks are selected
* observation of the performance of site tasks results in a revised characterization of the hazards
* new chemical, biological, or physical hazards are identified
* exposure data indicate changes in the concentration and/or likelihood of exposure
* new/different control measures are selected

When JHAs are modified, related provisions in other chapters of this HASP are modified as needed.

Table 2-1: Site-Specific Job Hazard Analysis

Operational Phase	Phase No	Task/Operation	Location Where Task/Operation Performed
JH 01	1	On shore loading and handling	Harrison Slough Boat Access Docks

Conducted	Print Name	Signature
8/29/2011	David Kluttz	

Chemical Hazards

Chemical Name	Source	Concentration	Exposure Potential During Operations
Weedestroy	Containers, Tanks, and Decks	100	Unlikely
Weedestroy	Containers, Hoses, and Pumps	100	Unlikely

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential During Operations
Tripping over hoses	Hoses	Unlikely
Falling Overboard	Water	Unlikely

Biological Hazards

Name of Biological Hazard	Source	Exposure Potential During Operations

No Biological Hazards

Control Measures Used

Engineering Controls: Locate pump, tank and hoses to reduce tripping hazards.
Work Practices: Exercise care when loading and handling, exercise care when moving and transporting equipment and use proper Personal Protection Equipment to reduce exposure hazard. Follow Aquatic Herbicide Label instructions.

Level of PPE:
Hats
Gloves
Shoes with socks
Eye Protection
Choose an item.

PPE Upgrade: No

PPE Downgrade: No

Table 2-1: Site-Specific Job Hazard Analysis

Operational Phase	Phase No	Task/Operation	Location Where Task/Operation Performed
JH 02	1	On boat application to targeted vegetation	Harrison Slough

Conducted	Print Name	Signature
8/29/2011	David Kluttz	

Chemical Hazards

Chemical Name	Source	Concentration	Exposure Potential During Operations
Weedestroy	Containers, Tanks, and Decks	100	Unlikely
Weedestroy	Containers, Hoses, and Pumps	100	Unlikely

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential During Operations
Tripping over hoses	Hoses	Unlikely
Falling Overboard	Water	Unlikely

Biological Hazards

Name of Biological Hazard	Source	Exposure Potential During Operations

No Biological Hazards

Control Measures Used

Engineering Controls: Locate pump, tank and hoses to reduce tripping hazards.
Work Practices: Exercise care when loading and handling, exercise care when moving and transporting equipment and use proper Personal Protection Equipment to reduce exposure hazard. Follow Aquatic Herbicide Label instructions.

Level of PPE:
- Hats
- Eye Protection
- Gloves
- Long Sleeve Shirt or Coveralls
- Shoes with socks

PPE Upgrade: No

PPE Downgrade: No

2.2 Employee Notification of Hazards and Overall Site Information Program

The information in the JHAs and the attached data sheets is made available to all employees who could be affected by it prior to the time they begin their work activities. Modifications to JHAs and the accompanying data sheets are communicated during routine briefings.

The person responsible for providing site information, this HASP, and any modifications to the HASP to other contractors and subcontractors working on this site is: David Kluttz.

3.0 EMERGENCY RESPONSE PLAN

(in compliance with 29 CFR 1910.120(l) and 1910.120(b)(4)(ii)(H)

This is the site-specific emergency response plan. This chapter of the Health and Safety Plan describes potential emergencies at this site, procedures for responding to those emergencies, roles and responsibilities during emergency response, and training that workers must receive in order to follow emergency procedures.

This emergency response plan is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

* pre-emergency planning
* personnel roles, lines of authority, and communication
* emergency recognition and prevention
* emergency medical treatment and first aid
* PPE and emergency equipment

3.1 Pre-emergency Planning

This site has been evaluated for potential emergency occurrences, based on site hazards, the tasks within the work plan.

Table 3-1 Potential Site Emergencies

Type of Emergency	Source of Emergency	Location of Source
Chemical Spill	Containers	All Loading and Handling Areas
Physical Injury	Lifting, Falling, Tripping, Drowning	All Loading, Handling and Application Sites

3.2 On-Site Emergency Response Equipment

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean-up. Emergency response equipment stocked on this site is listed in Table 11-2. The equipment inventory and storage locations are based on the potential emergencies described in Table 11-1. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this site but not ordinarily stocked.

Any additional PPE required and stocked for emergency response is also listed in Table 3-2 below. During an emergency, the Emergency Response Coordinator is responsible for specifying the level of PPE required for emergency response.

Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Table 3-2 Emergency Equipment and Emergency PPE

Emergency	Specific Type	Quantity Stocked	Location Stored
Fire extinguisher		5	Boats and Trucks
First Aid and Eye Wash Kits		2	Boats
Spill Kits		2	Loading Area
Emergency PPE	**Specific Type**	**Quantity Stocked**	**Location Stored**
Rubber gloves		24	Boats and Trucks
Eye protection		12	Boats and Trucks

Figure 3-3a provides a map to the nearest emergency medical assistance.

Figure 3-3 Map to Nearest Emergency Medical Assistance

Northwest Specialty Hospital
1593 East Polston Avenue, Post Falls, Idaho 83854

Figure 3-3b Contains driving instructions to the nearest Emergency Medical Assistance and is posted in the following locations;

Boats and Trucks

Driving directions to 1593 East Polston Avenue, Post Falls, ID 83854-5326Harrison Slough 1. Head northeast on E Harlow Point Rd toward ID-97 N/ID-97 Scenic N 0.9 mi 2. Sharp left onto ID-97 N/ID-97 Scenic N 1.7 mi 3. Turn left to stay on ID-97 N/ID-97 Scenic N 22.2 mi 4. Turn left to stay on ID-97 N/ID-97 Scenic NContinue to follow ID-97 N 2.5 mi 5. Turn left to merge onto I-90 W toward Coeur D' Alene/Spokane 16.0 mi 6. Take exit 6 for Seltice Way toward City Center 0.4 mi 7. Turn right onto E Seltice Way 0.3 mi 8. Take the 2nd right onto N Idaho St 0.2 mi 9. Take the 2nd right onto E Mullan AveDestination will be on the right 0.6 mi 1593 East Polston Avenue, Post Falls, ID 83854-5326

3.4 Roles and Responsibilities for On-Site and Off-Site Personnel

David Kluttz is responsible for implementing the emergency response plan and coordinates emergency response activities on this site. He/she provides specific direction for emergency action based upon information available regarding the incident and response capabilities and initiates emergency procedures, including protection of the public and notification of appropriate authorities.

In the event of an emergency, site personnel are evacuated and do not participate in emergency response activities, except as indicated below.

Limited On-Site Emergency Response Activities

For spills

Turn off all pumps
Close all valves
Surround spill with containment dike
Use Absorbent mats to clean up spill
Place in plastic containment bags

For Injuries

Assess extent of injury
Administer First Aid if appropriate
Contact Emergency Medical Personnel
Transport to Northwest Specialty Hospital: 1593 East Polston Avenue, Post Falls, Idaho 83854

3.5 Emergency Medical Treatment and First Aid

Personnel who require medical care and/or who are transferred to a medical facility are accompanied by MSDSs and other applicable hazard data to apprise caregivers of the chemicals and hazards to which the victim has been potentially exposed. The emergency medical care facility for this site is Northwest Specialty Hospital: 1593 East Polston Avenue, Post Falls, Idaho 83854. The route to the facility is shown in Figure 3-3 a & b.

Table 3.6 Emergency Contact Information

The list of telephone numbers below are the emergency contact numbers for this site. These emergency numbers are verified to be accurate, working numbers. Site personnel are trained and rehearsed in site-specific emergency calling procedures. A copy of this contact information is posted at the following locations:

Trucks and Boats

SITE PERSONNEL

Title	Contact	Telephone
Project Manager (PM)	David Kluttz	208-597-6601
Site Safety and Health Officer (SSHO)	Cathy Allen	208-597-1841
Emergency Response Coordinator (ERC)	David Kluttz	208-597-6601
Emergency Response Coordinator 1st Alternate	Cathy Allen	208-597-1841
Emergency Response Coordinator 2nd Alternate	Steve Mclaine	208-290-5064

Agency	Contact	Address/Location Telephone
Ambulance/EMS		911
Police		911
Fire		911
Primary Medical Facility	Northwest Specialty Hospital	Northwest Specialty Hospital: 1593 East Polston Avenue, Post Falls, Idaho 83854. 208-262-2300
State Police		911
Local Emergency Response Agency		911
Emergency Medical Assistance		911

4.0 TRAINING PROGRAM

(in compliance with 29 CFR 1910.120(e))

This training program is consistent with the requirements of 29 CFR 1910.120(e) and addresses the following site-specific information:

* training for site workers
* site briefings for visitors and workers
* management and supervisor training

4.1a Training Elements to be Covered for Site Workers:

- names of personnel and alternates responsible for site safety and health
- safety, health and other hazards present on the site
- use of PPE
- work practices by which the employee can minimize risks from hazards
- safe use of engineering controls and equipment on the site
- the emergency response plan detailed in Chapter 3 of this HASP
- the spill containment program detailed in Chapter 5 of this HASP

4.1b Site-Specific Briefings for Visitors

A site-specific briefing is provided to all site visitors who enter this site. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

4.1c HASP Information and Site-Specific Briefings for Workers

Site personnel review this HASP and are provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with this HASP and the information and requirements it contains. Additional briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing site characterization and analysis. Conditions for which we schedule additional briefings include, but are not limited to: changes in site conditions, changes in the work schedule/plan, newly discovered hazards, and incidents occurring during site work.

4.2 Initial Training

Initial training requirements are based on a worker's potential for exposure.

4.3 Management and Supervisor Training

On-site managers and supervisors who are directly responsible for or who supervise workers engaged in hazardous operations are licensed herbicide applicators in the State of Idaho. Mixer/Loaders who work with the applicators are trained and supervised by licensed applicators.

5.0 SPILL CONTAINMENT PROGRAM

(in compliance with 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii))

This chapter of the Health and Safety Plan describes the potential for hazardous substance spills at this site and procedures for controlling and containing such spills. The purpose of this chapter of the Plan is to ensure that spill containment planning is conducted and appropriate control measures are established.

The spill containment program is consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii) and addresses the following site-specific information:

* potential hazardous substance spills and available controls
* initial notification and response
* spill evaluation and response
* post-spill evaluation

5.1 Potential Spills and Available Controls

Table 5-1 below lists the location and type of potential hazardous substance spills at this site. This table also describes the activities or situations in which an accidental spill could occur and the type of release--either an incidental or an emergency release -- likely to result.

Wherever spills, leaks, or ruptures can occur, this site keeps suitable spill kits available. Their location is noted in Table 5-1. In addition, all areas subject to potential spills are diked or a means to adequately dike these areas in the event of a spill is available so that the entire volume of the hazardous substance being spilled can be contained and isolated. The type and location of spill containment equipment is also listed in Table 5-1.

Table 5-1 Potential Spills and Controls

Hazardous Substance	Location	Source of spill	Potential maximum qty of spill	Classification of spill	Available Spill Containment Equipment	Equipment Location
Herbicide	Lake shoreline loading herbicide into boats	Equipment failure	Unknown	Emergency	Spill Kit	Trucks & Boats
Herbicide	Lake shoreline loading herbicide into boats	Hose/line rupture	Unknown	Emergency	Spill Kit	Trucks & Boats
Herbicide	Spill in boat	Containers, Hoses, Hoppers, Tanks	Unknown	Emergency	Dispose of spillage in treatment zone not to exceed Aquatic Herbicide Label Concentrations	

5.2 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill will immediately notify David Kluttz, Project Manager. The worker will, to his/her best ability, report the hazardous substance involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries. The site Emergency Response Plan, found in Chapter 3 of this HASP, will immediately be implemented if an emergency release has occurred.

5.3 Spill Evaluation and Response

David Kluttz, Project Manager is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated.

The procedures of the Emergency Response Chapter of this HASP are implemented when the spill is determined to require emergency precautions and action. If necessary to protect nearby community members, notification of the appropriate authorities is made. Table 5-3 below lists the spill conditions that trigger notification of Federal, state, and local agencies.

Table 5-3 Off-site Notification Requirements

Hazardous Substance	Location	Spill Volume/ Conditions	Required Notification
Herbicide	Lake Shoreline, loading herbicide into boats	TBD By PM	Linda Ely

When an incidental release occurs, cleanup personnel receive instructions in a pre-cleanup meeting as to spill conditions, PPE, response activities, decontamination, and waste handling. The following are general measures that response/ cleanup personnel take when responding to a spill:

* To minimize the potential for a hazardous spill, hazardous substance and contaminated soils, control/absorbent media, drums and containers, and other contaminated materials are properly stored and labeled.

* When a spill occurs, only those persons involved in overseeing or performing spill containment operations will be allowed within the designated hazard areas. If necessary, the area will be roped, ribboned or otherwise blocked off. Unauthorized personnel are kept clear of the spill area.

* Appropriate PPE, as specified during the pre-cleanup meeting, is donned before entering the spill area.

* Appropriate spill control measures are specified in the pre-cleanup meeting and applied during spill response.

* Whenever possible without endangerment of personnel, the spill is stopped at the source or as close to the source as possible.

* Ignition points are removed if fire or explosion hazards exist.

* Surrounding reactive materials are removed.

* Drains or drainage in the spill area will be blocked or surrounded by berms to exclude the spilled waste and any materials applied to it.

* Provisions are made to contain and recover a neutralizing solution, if used.

* Small spills or leaks from a drum, tank, or pipe will require immediate cleanup to prevent or limit employee exposure. For small spills, sorbent materials such as sand, sawdust, or commercial sorbents from the spill kit are placed directly on the waste to prevent further spreading and aid in recovery.

* If any spill is large and/or continuing, an initial isolation area is created. Large spills are diked at the leading edge of the spill. Berms of earthen or sorbent material are constructed downstream of the leading edge of the spill to contain it. Where feasible, pumps are utilized to transfer the liquid to appropriate containers.

* Spill area is sprayed with appropriate foam where the possibility of volatile emissions exist.

* If the spill results in the formation of a toxic vapor cloud, from vaporization, or reaction with surrounding materials or by the outbreak of fire, further evacuation may be required.

* To dispose of spill waste, all contaminated sorbents, liquid waste, or earthen material will be cleaned up and placed in small quantities (50 pounds) in approved drums for proper storage or disposal as hazardous waste.

5.4 Post-Spill Evaluation

A written spill response report is prepared at the conclusion of clean-up operations. The report includes, at a minimum, the following information:

* date of spill incident
* cause of incident
* spill response actions
* any outside agencies involved, including their incident reports
* lessons learned or suggested improvements

The spill area is inspected to ensure the area has been satisfactorily cleaned. The use of soil, water, and air sampling is utilized in this determination as necessary. The root cause of the spill is examined and corrective steps taken to ensure the engineering and control measures in place have performed as required. If alternative precautions or measures are needed, they are made available and implemented.

6.0 PERSONAL PROTECTIVE EQUIPMENT

(in compliance with 29 CFR 1910.120(b)(4)(ii)(C) and 29 CFR 1910.120(g))

This chapter of the HASP describes how personal protective equipment (PPE) is used to protect against employee exposures to hazardous substances and hazardous conditions on this site.

* PPE selection criteria
* Site-specific PPE ensembles
* Criteria for PPE upgrades and downgrades
* Procedures for determining work duration
* Training in use of PPE
* Respiratory protection
* Hearing conservation
* PPE maintenance && storage
* Evaluation of this program

The person with the overall responsibility for the PPE program is Cathy Allen.

6.1 PPE Selection Criteria

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices, and PPE are used to protect employees.

An initial level of PPE is assigned to each task to provide an adequate barrier to exposure hazards. Initial PPE ensembles are selected based on the anticipated route(s) of entry of the hazardous substances on site and their concentration. Ensemble materials are selected using permeation data supplied by individual manufacturers. Materials providing the greatest duration of protection have been chosen. Tear and seam strength of the PPE are also considered to ensure ensemble durability while work is performed. When necessary, multiple layers of protection are used to accommodate the range of hazards that may be encountered. Where possible, employees are provided with a range of component sizes to ensure properly fitted PPE.

The following criteria are used in selecting PPE levels at this site.

Use of Level D Protection

Employees use Level D protection during tasks that have the following characteristics:

* The atmosphere contains no known or suspected hazardous substances at concentrations that meet or exceed the published exposure limit.

* Contact with hazardous levels of any chemicals through splashes, immersion, or by other means will not occur.

* There is no potential for unexpected inhalation or contact with hazardous levels of any chemical.

6.2 Use of PPE

Site-specific PPE ensembles and materials are identified below in Table 6-2a. These ensembles are consistent with Appendix B of 29 CFR 1910.120. PPE is used in accordance with manufacturers' recommendations.

Table 6-2a Site-Specific PPE Ensembles

Equipment	Model Purchased	Material	Employee
Level D			
Coveralls/Standard Work Clothes	Coveralls or long sleeve shirts and long pants, hats	Cotton or poly cotton	No
Boots/shoes	Shoes with socks		Yes
Gloves	Chemical Resistant		No
Other: Eye protection	Glasses		No
Other: Ear Muffs	Ear Muffs on boats		No

Criteria for PPE Upgrades and Downgrades

Cathy Allen has the authority to upgrade or downgrade PPE in a timely manner to respond to changing site conditions and to protect employee health and safety. Routine evaluation of the effectiveness of the PPE program is conducted as identified in Section 6.7 below.

Procedures for Determining Work Duration

Cathy Allen identifies task-specific work duration based on the following:

* Physiological requirements of the task

* PPE level for the task

* Ambient temperature and humidity

* Acclimatization of the work force

Employees are informed about task-specific work duration by the SSHO, during initial training and whenever a change is necessary

6.3 Training

Employees receive general training regarding proper selection, use and inspection of PPE during initial training and subsequent refresher training. Site-specific PPE requirements, including task-specific PPE, ensemble components, and inspection and maintenance procedures are communicated as identified in Chapter 4, Training.

6.4 Respiratory Protection

Respiratory protection is not used on this site in accord with the label of the products being applied.

6.5 Hearing Conservation

Employees must use hearing protection when traveling on airboats at speeds which require engine revolutions above 2000 rpm.

6.6 PPE Maintenance & Storage

Table 6-6 describes the PPE maintenance schedule for this site. The person responsible for overseeing PPE maintenance & storage procedures and for maintaining the inspection record is Cathy Allen.

Table 6-6 PPE Maintenance

Type of PPE	Model	Inspection Frequency	Done by	Cleaning Frequency	Done by
Level D					
Component	Coveralls or long sleeve	Daily	Applicators	NA	NA
Component	Shoes with socks	Daily	Applicators	NA	NA
Component	Ear Muffs	Daily	Applicators	NA	NA
Component	Glasses	Daily	Applicators	NA	NA
Component	Ear Muffs	Daily	Applicators	NA	NA

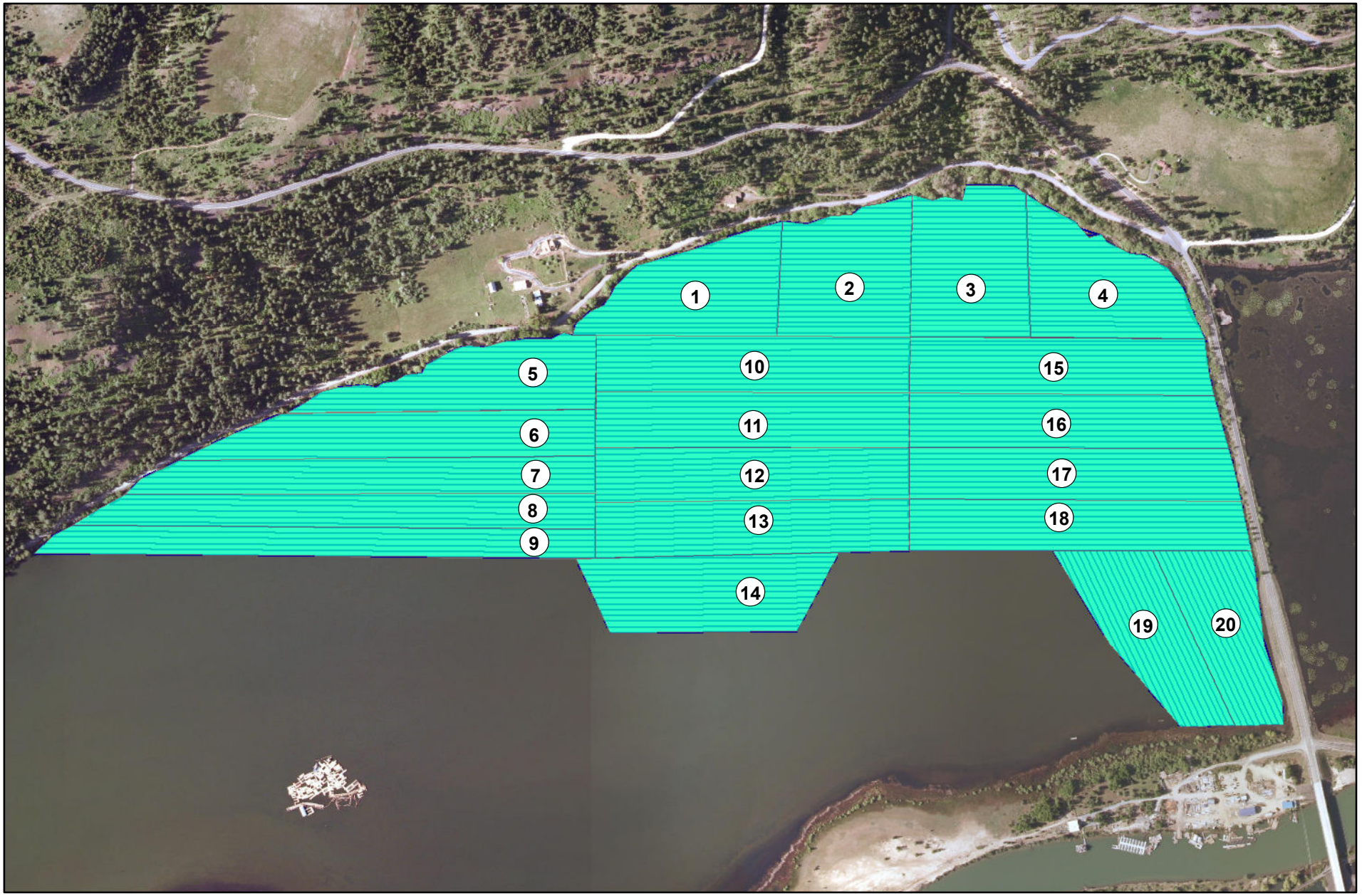
Defective or damaged equipment is not used and is reported to David Kluttz so that the equipment can be repaired or discarded.

6.7 Evaluation of PPE Program

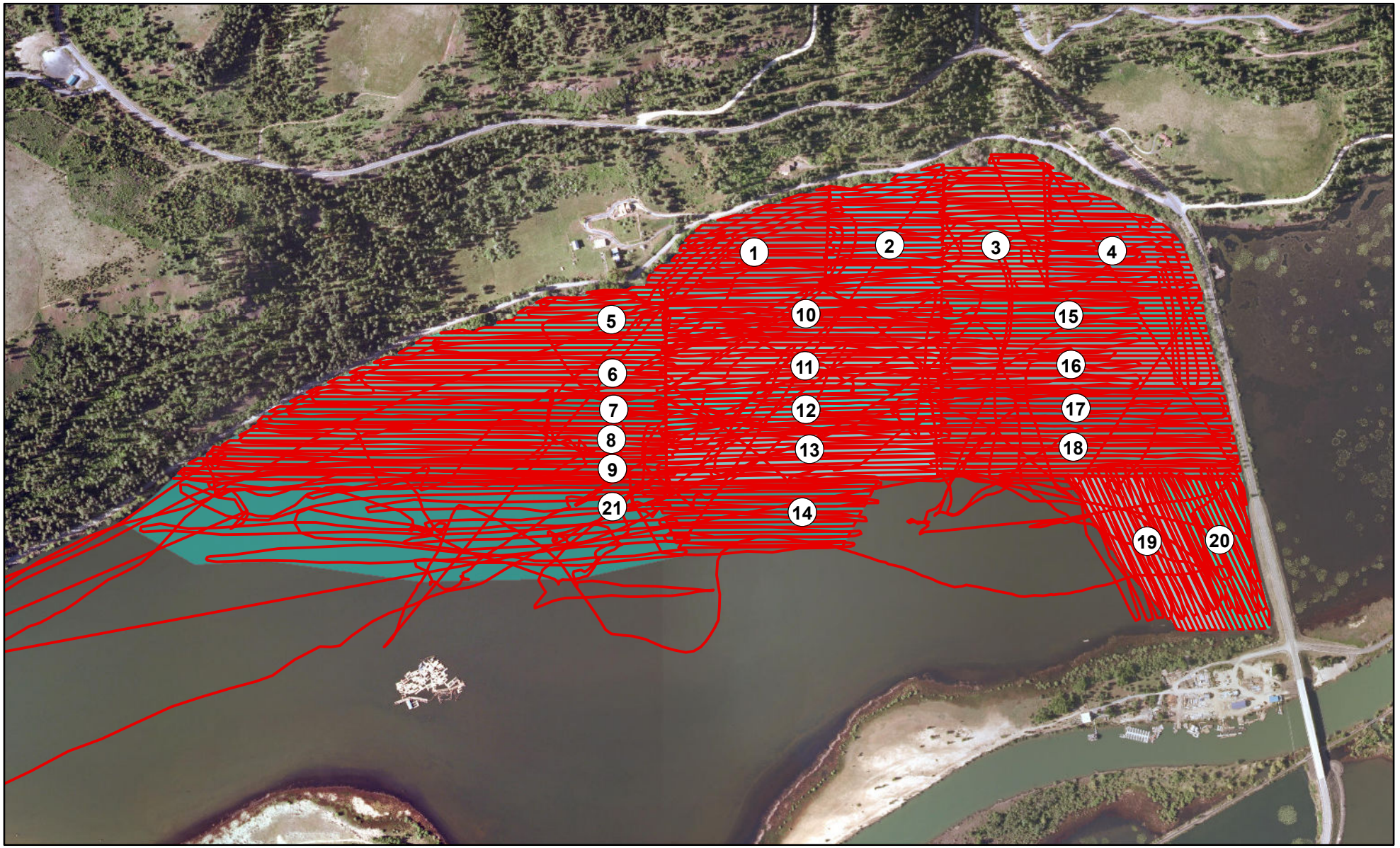
Evaluation of the effectiveness of site PPE selections occurs throughout site activities in response employee feedback.

APPENDIX B – TREATMENT MAPS

HARRISON SLOUGH PRE-TREATMENT MAP 2011



Harrison Slough Aquatic Treatment for Eurasian Watermilfoil
August 2011



RESTORATION LAKELAND SERVICES LLC

Treatment Tracks

Feet
0 275 550 825 1,100 1,375 1,650

Miles
0 0.075 0.15 0.225 0.3 0.375

N

APPENDIX C – HERBICIDE APPLICATION LOG

Appendix D

Lakeland Restoration Services, LLC
78 E River Spur Rd, Priest River, ID 83856
Phone/Fax: (208) 448-2222
www.lakelandrs.com

HERBICIDE APPLICATION LOG

Dates of Application August 30, 2011	**Owner Name and Address** Idaho Department of Lands by Kootenai County Noxious Weed Control, 10905 N. Ramsey, Hayden, ID 83835			
Address of Site Treated Harrison Slough 47.4688, -116.7732 **Sec** 20 **Twp** 51N **Rg** 3		**Application Rate Recommended By** Linda Ely, Kootenai Co Weed Superintendent		
Site or Crop Treated Waterway for Eurasian watermilfoil			**Size of Treated Area** 242.07	
Time of Application **Start** 8:30 a.m. **End** 4:00 p.m.	**Wind Direction** S	**Wind Velocity** Variable: 2-7 mph	**Temperature** 65-82° F	☒ **Sunny** ☐ **Partly Cloudy** ☐ **Overcast**

No of Staff 5

Application Equipment Used
- ☒ **Airboat**
- ☒ **Hewescraft**
- ☒ **Liquid injector system**
- ☐ **Granular spreader(s)**

Names & License numbers of Staff:

Name	License No.
David L. Kluttz	41977
Steve McClain	49627
Cathy Allen	Mixer/Loader Cert.
Jacob Nesbitt	Mixer/Loader Cert.

Pesticide Applied	EPA Reg #	Dilution Rate (% or amt/gal)	Rate of Application (amt per ac or sf)	Total Amount Applied (lbs or gal used)
1 Weedestroy	228-145	N/A	2.0 (1.42 gal/acre foot)	2413 gal
2 DMA-4	62719-3	N/A		540 gal
3				

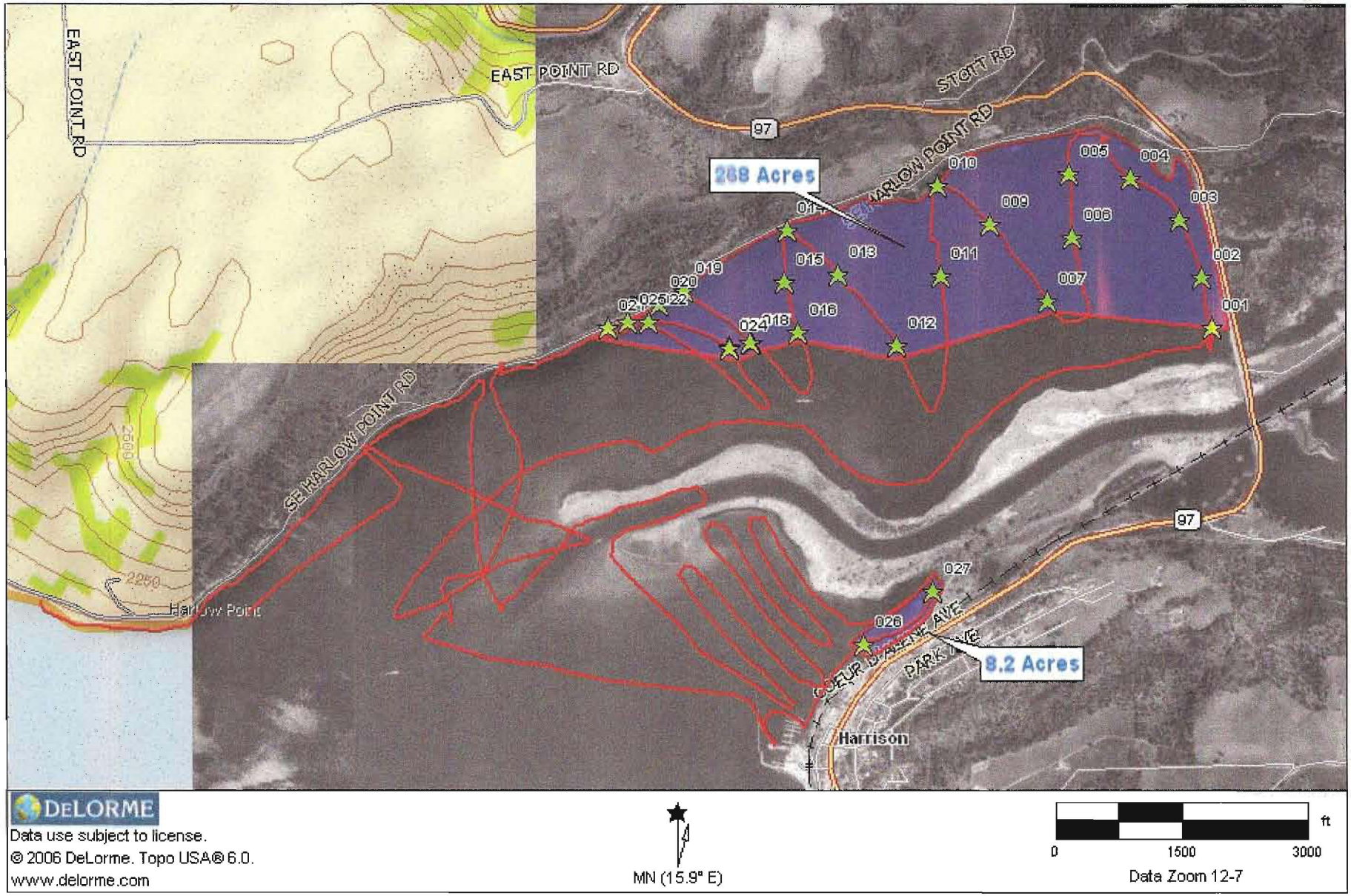
Worker Protection Required? ☐ Yes ☒ No	Date of Contact	Time of Contact	Person Contacted

Map of Area: (or attach)

See attached treatment map

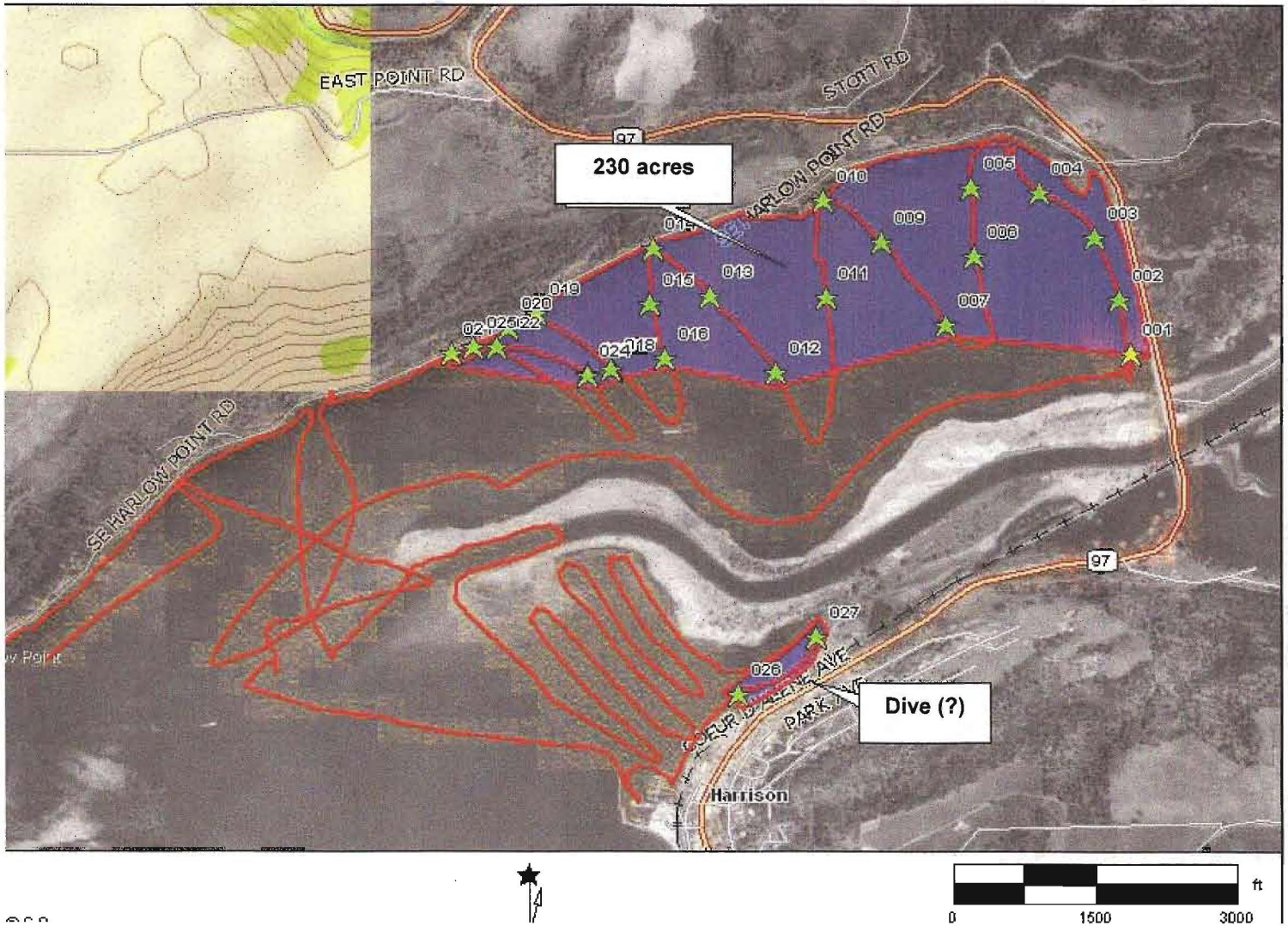
APPENDIX D – AREAS IDENTIFIED DURING INITIAL SURVEY

MAP IV
2007 IECWMA SURVEY-HARRISON

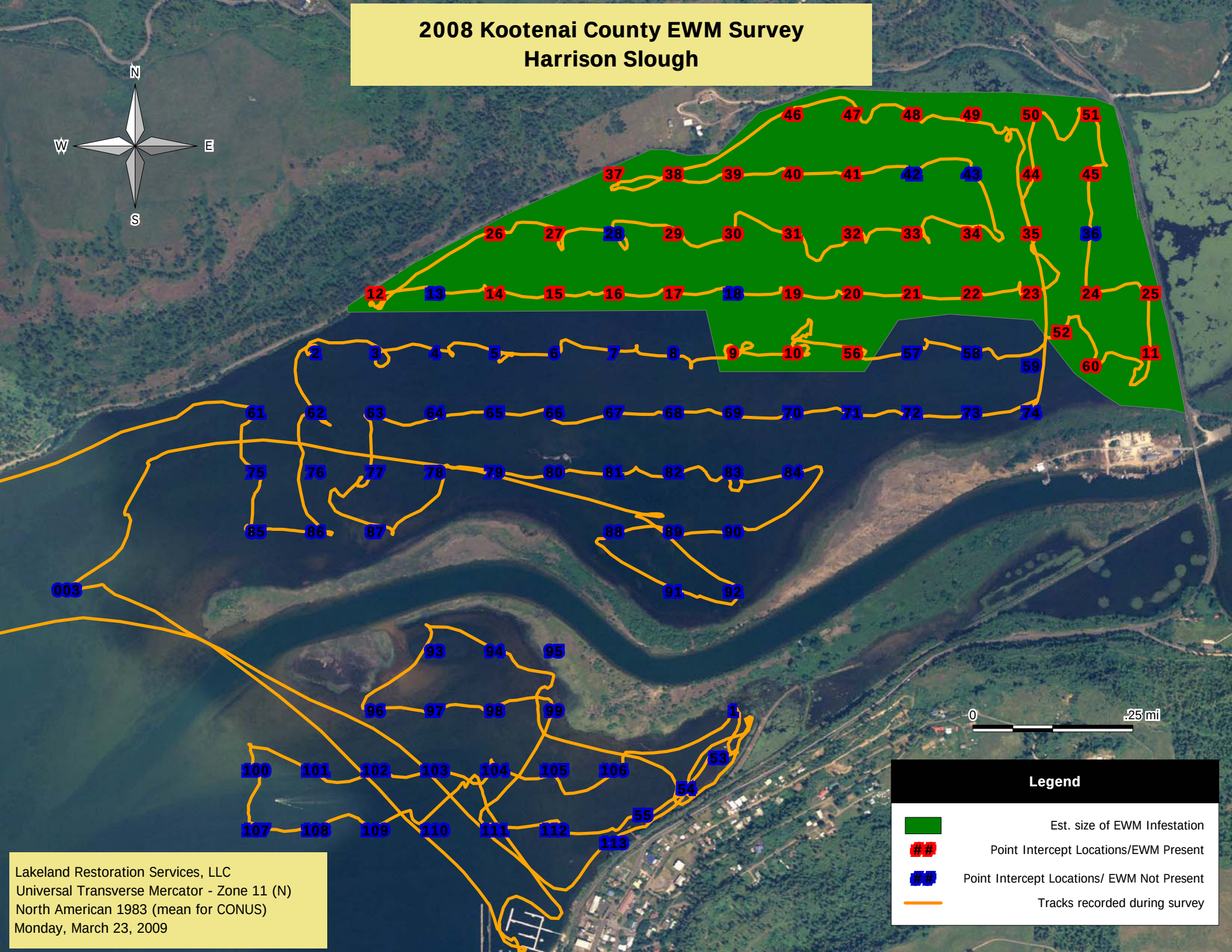


Appendix D

2008 Harrison Slough Potential Herbicide Treatment



Appendix D


2008 Kootenai County EWM Survey
Harrison Slough
N
W
E
S
46 47 48 49 50 51
37 38 39 40 41 42 43 44 45
26 27 28 29 30 31 32 33 34 35 36
12 13 14 15 16 17 18 19 20 21 22 23 24 25
2 3 4 5 6 7 8 9 10 56 57 58 59 52 60 11
61 62 63 64 65 66 67 68 69 70 71 72 73 74
75 76 77 78 79 80 81 82 83 84
85 86 87 88 89 90
003 91 92
93 94 95
96 97 98 99 1
100 101 102 103 104 105 106 53 54
107 108 109 110 111 112 113 55
0 .25 mi
Legend
Est. size of EWM Infestation
Point Intercept Locations/EWM Present
Point Intercept Locations/ EWM Not Present
Tracks recorded during survey
Lakeland Restoration Services, LLC
Universal Transverse Mercator - Zone 11 (N)
North American 1983 (mean for CONUS)
Monday, March 23, 2009

APPENDIX E

COMMENTS AND AVISTA RESPONSES

On December 29, 2011 the 2011 Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters Summary Report was submitted to the Idaho State Department of Agriculture, Idaho Department of Environmental Quality, the Coeur d'Alene Tribe and the Kootenai County Noxious Weed Control Board for a 30 day period to review the report and make comments or recommendations. Comments were not received from the Idaho State Department of Agriculture, Coeur d'Alene Tribe or Kootenai County Noxious Weed Control Board.

From: Armes, David [mailto:David.Armes@avistacorp.com]
Sent: Thursday, December 29, 2011 3:41 PM
To: Glen.Pettit@deq.idaho.gov; Glen.Rothrock@deq.idaho.gov; Thomas E. Woolf; lely@kcgov.us; becki.witherow@deq.idaho.gov; Dave Lamb
Cc: Fitzhugh, Speed (Elvin)
Subject: 2011 Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters Summary Report

Greetings,

In accordance with the Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters, attached for your review is the 2011 Coeur d'Alene Lake Aquatic Weed Management Plan for Non-Tribal Waters Summary Report. Please provide any written comments prior to January 28, 2012 as we will need to incorporate your comments, as appropriate, prior to its submittal to the Federal Energy Regulatory Commission by March 1st.

Thanks!

David Armes | Avista Utilities
Terrestrial Resource Specialist
Spokane River Licensing Branch
1411 E. Mission Ave MSC-1 | Spokane, WA 99202
office: (509) 495-2796 | cell: (509) 999-4475
david.armes@avistacorp.com

Comments from the Idaho Department of Environmental Quality

From: Becki.Witherow@deq.idaho.gov [mailto:Becki.Witherow@deq.idaho.gov]
Sent: Monday, January 09, 2012 10:09 AM
To: Armes, David
Subject: Aquatic Weeds Report

Hi Dave,
The report looks good. I had a couple of minor comments/suggestions:

Pg 4; 2nd to last paragraph; last sentence: we reference 3 field manuals
Pg 5; 1st paragraph, second to last sentence: the "2" in "m2" should be superscript
Pg 7, 1st paragraph, 2nd to last sentence: "…Priority are in protected bays"
Pg 7, 3rd paragraph, 1st sentence: "bay" should be capitalized
Pg 8, under the heading "Bottom Barriers": I would say, "Installation started on August 8th…" and are the bottom barriers still in place? It's been over 8 weeks since August 11th.
Your page numbering gets off starting at pg 14

In the 3/21/11 Annual meeting minutes, under IDEQ Survey, the technique uses quadrats (not quadrants). Under Treatments, I would say "IDEQ does not conduct milfoil treatments." "complete" sounds like we start but don't finish treatments.
4. Review 2011 Proposed Activities: the bay is Loffs also clarify that is was Glen Rothrock wanting clarification from Tom Education: the May 4th workshop was held by both IDEQ and the Tribe.

Thanks!
Becki

From: Glen.Rothrock@deq.idaho.gov [mailto:Glen.Rothrock@deq.idaho.gov]
Sent: Thursday, January 05, 2012 5:03 PM
To: lely@kcgov.us; Armes, David; Thomas.Woolf@agri.idaho.gov; Glen.Pettit@deq.idaho.gov; dlamb@cdatribe-nsn.gov; Becki.Witherow@deq.idaho.gov
Subject: RE: Lake CdA Milfoil Brochure

David: attached are a few edits I made to the draft Avista weed report (mostly typos, yellow highlight and red pen on the pdf).

Avista Responses

The recommended grammatical changes and edits provided by IDEQ have been made to the Summary Report.