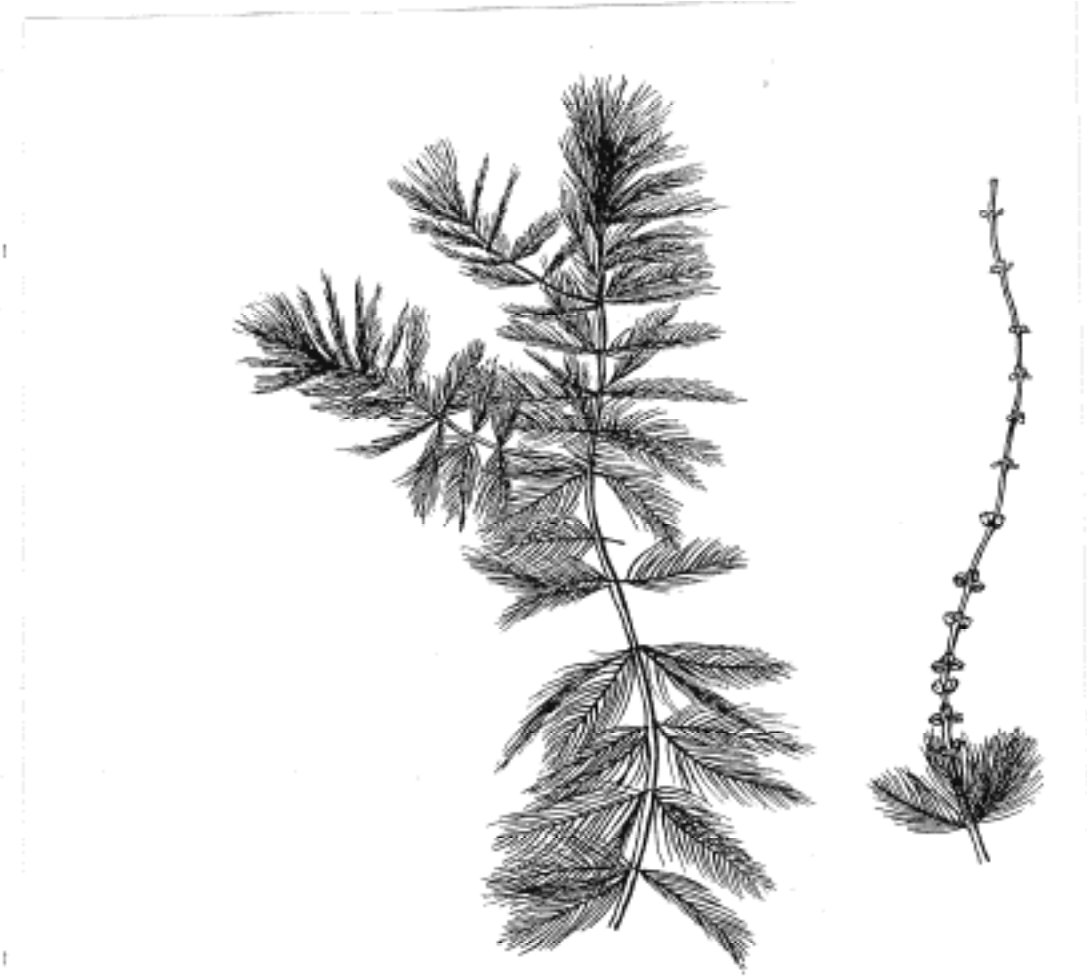
FINAL ENVIRONMENTAL ASSESSMENT

Milfoil Eradication Pilot Project

Near Newport, Washington
June 12, 2007



EURASIAN WATERMILFOIL, Myriophyllum spicatum

US ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PEND OREILLE RIVER
NEAR NEWPORT, WASHINGON

US Army Corps
of Engineers
Seattle District

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1 INTRODUCTION

The purpose of this project is to evaluate an effective, cost efficient and environmentally safe method for the selective control and or eradication of Eurasian watermilfoil in the Pend Oreille River.

During the last century the Pend Oreille River has undergone a variety of anthropomorphic changes from the construction of dams, introduction of exotic species and resource extraction. Many of these changes have a deleterious effect on the River system and its associated natural resources. The area of Box Canyon (from Box Canyon Dam (River Mile (RM) 34.4 to Albeni Falls Dam (RM 90.1) has been especially impacted by changes in the water regime, fire events, drainage and levee construction, timber management and residential construction (Intermountain Province SubBasin Plan May, 2004).

Over the past several years much labor and fiscal resources have been expended to improve the conditions in the area from locally led efforts through State, Tribal and Federal programs. Water quality is one area that has drawn a special focus. Temperature, water quantity and associated timing, suspended sediments and invasive aquatic vegetation are some examples of water quality issues that are currently being addressed.

This Environmental Assessment (EA) focuses on one of the more important aspects of water quality in the Pend Oreille, that is the control or eradication of the introduced aquatic plant *Myriophyllum spicatum* or more commonly referred to as Eurasian watermilfoil. Reduction and management of Eurasian watermilfoil populations in the Pend Oreille River Basin is identified as one of the major goals in the Clark Fork-Pend Oreille Watershed Management Plan over the next decade.

Eurasian watermilfoil was introduced into the United States over 120 twenty years ago. It was first observed in the Chesapeake Bay but has spread across the major water bodies in the U.S and Canada mainly by attaching itself to boats. The local infestation in the Pend Oreille Basin is believed to have spread originally downstream from the Okanogan Lake Chain into Lake Osoyoos and from there it spread to the Okanogan and Columbia River Basins around 1974. It was observed in the lakes around the Pend Oreille in the mid 90s (Washington Department of Ecology (WDOE) website- Non-Native Freshwater Plants-Eurasian Watermilfoil). In a letter from Pend oreille County Public Utility District (see appendix A), they claim that Eurasian watermilfoil has been in the Pend oreille River since the mid1970s. There are currently about 3,000 acres of Eurasian watermilfoil estimated in the Pend Oreille River.

Eurasian watermilfoil is a member of the Haloragaceae family and is characterized by its weather-beaten featherlike leaves containing 12 to 16 pairs in close together leaflets (Hotchkiss, N., 1972, Common Marsh, Underwater and Floating-leaved Plants of the United States and Canada. 1972, see the cover drawing of this report). It is a submerged, rooted perennial dicotyleton with whorled leaves. Inflorescence is small pink flowers that form on terminal spikes. Found in shallow, slow moving areas milfoil can grow in depths from just a few feet to 30 feet. It typically forms dense monotypic stands or is the predominant species in vegetated shallows where it out competes native submerged aquatic species. Eurasian watermilfoil re-

produces primarily by fragmentation and occasionally by seed. Viable propagules can be as small as a stem portion carrying a single leaf node.

There are many reasons that this type of milfoil is not desirable. The plant is very aggressive and often dominates or completely eliminates natural vegetation leading to less diversity. It forms dense mats that reduces light, lowers dissolved oxygen and slows water, this affects the spawning potential for resident fish as well as other organisms. At high densities, Eurasian watermilfoil's foliage supports a lower abundance and diversity of invertebrates that serve as food for fish (Getsinger, K.D., 2005.).

Similar detrimental effects include accelerating the eutrification process due to the significant rates of plant sloughing and leaf turnover as well as decomposition of high biomass at the end of the growing season. This increases the internal loading of phosphorus and nitrogen to the water column. Eurasian watermilfoil impacts power generation and irrigation by clogging dam trash racks and intake pipes. It also interferes with recreational activities such as swimming, boating, fishing and waterskiing. In Washington State, private and government sources spend about $1,000,000 per year on Eurasian watermilfoil control Washington Department of Ecology web site- Non-Native freshwater Plants-Eurasian Watermilfoil).

1.1 Project Need and Project Locations.

Eurasian watermilfoil has had a detrimental effect on water quality, fishery habitat and the esthetic nature of the Pend Oreille River. There is a need to eradicate or at least control this infestation of a noxious aquatic weed. The U.S Army Corps of Engineers has a program that addresses nuisance aquatic weeds called the Aquatic Plant Control Program.

The purpose of this project is to evaluate an effective, cost efficient and environmentally safe method for the selective control (in this case the use of selective means a control method that distinguishes between different types of aquatic vegetation) and or eradication of Eurasian watermilfoil in the Pend Oreille River. The pilot project will use approved scientific methods to evaluate the outcome of the project.

There are three documents that are incorporated by reference into this Environmental Assessment. They are:

1. The Washington State Department of Ecology Environmental Impact Statement (EIS) for the Permitted Use of Triclopyr (final 2004, publication number 04-10-018)

2. Supplemental EIS Assessments of Aquatic Herbicides: Study No.00713, Volume 5 Triclopyr, Section 4- Environmental Effects (2001, publication number 04-10-015).

3. Review of the Toxicity and Environmental Fate of Triclopyr. 2004. Atunes-Kenyon S.E and Kennedy, G. Submitted to the Massachusetts Pesticide Board subcommittee.

The locations of the different test site are depicted below.

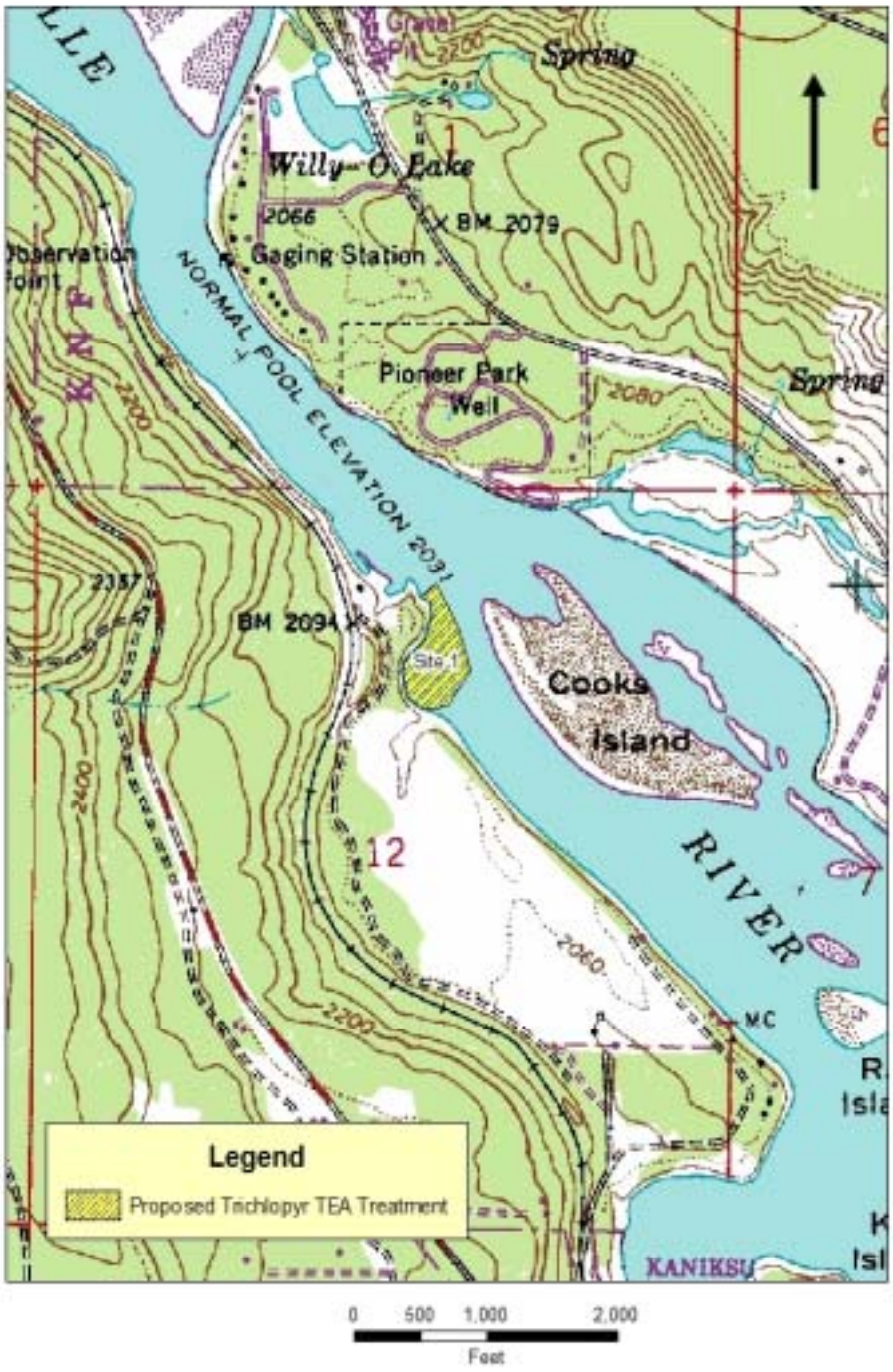

Figure 1-a. Project area, site 1.

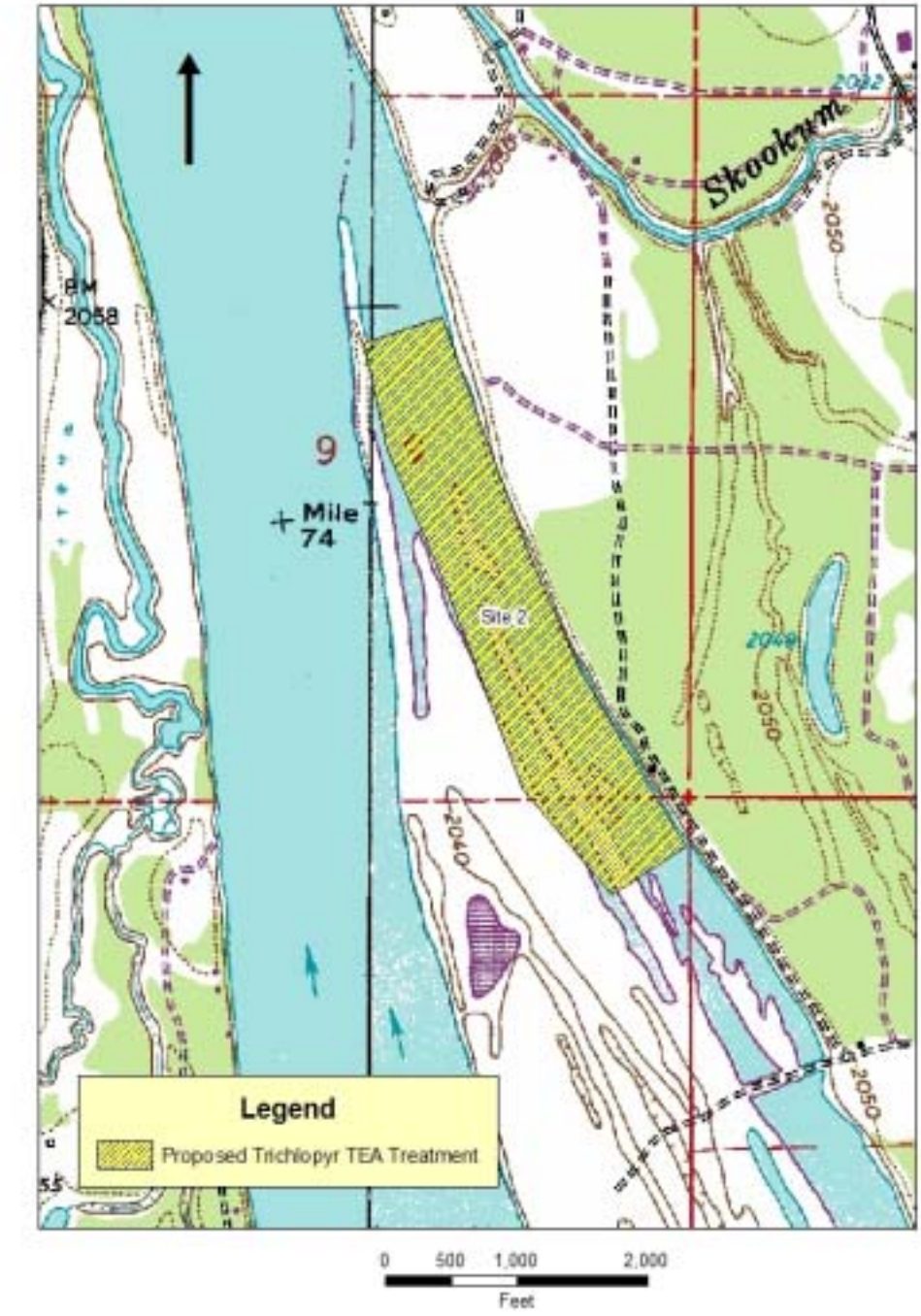

Figure 2-b. Project area, site 2.

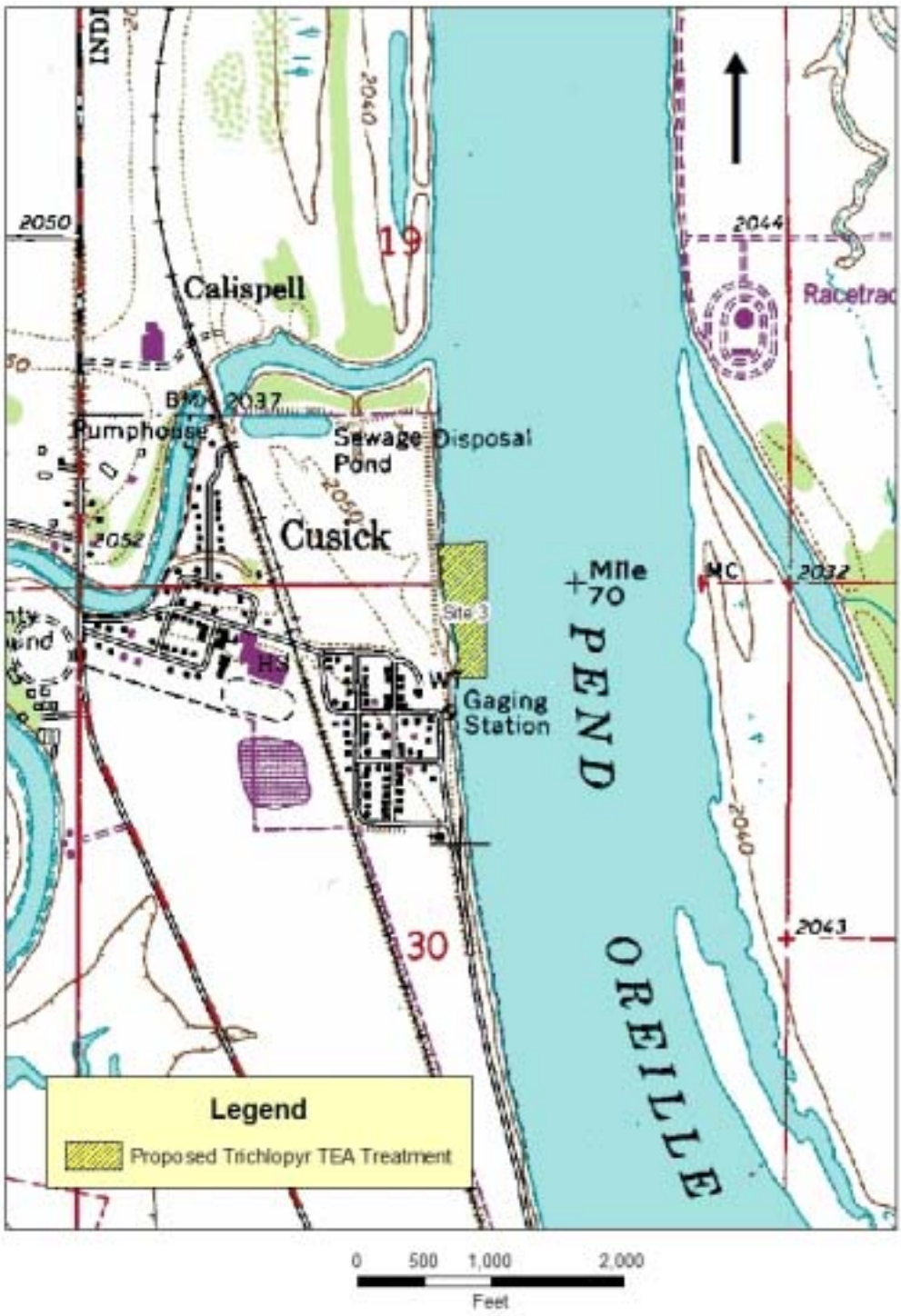

Figure 3-c. Project area, site 3.

1.2 Authority

The Corps of Engineers is conducting this project under the Aquatic Plant Control Research and Development program. The Authority for this program is section 104 of the Rivers and Harbors Act of 1958, (P.L. 85-500), as amended, (33 U.S.C. § 610); sections 103, 105, and 712 of Water Resource Development Act of 1986, (P.L. 99-662, 33 U.S.C. §§ 2213, 2215, 2289); sections 225 and 540 of the Water Resource Development Act of 1996, (P.L. 104-303, (33 U.S.C. § 610); and section 205 of the Water Resource Development Act of 1999, (P.L. 106-53, 33 U.S.C. § 610).

2 PROPOSED ACTION AND ALTERNATIVES

The following sections describe the proposed action (Alternative A, the preferred action); Alternatives B, C, D and a "No Action" Alternative were also considered for the Eurasian watermilfoil control.

2.1 Proposed Action (Alternative A, preferred-Application of Registered Herbicide)

Under this, the preferred alternative, it is proposed to apply and evaluate the herbicide Triclopyr (in the form of Renovate® OTF (on target flake) at three test sites in Box Canyon. Results from these evaluations will provide guidance to resource managers for use of the new formulation in flowing-water environments in the Pend Oreille River and similar sites in the Pacific Northwest Region.

Objectives

The objectives of this pilot study for the preferred alternative will be to:

a) document the level of Eurasian watermilfoil control provided by the Triclopyr (in the form of Renovate® OTF (on target flake) herbicide Renovate® OTF (triclopyr) in the Pend Oreille River;
b) monitor impacts on the non-target native submersed plant community in the treated sites;
c) measure dissipation of aqueous triclopyr residues within and downstream from treated sites, and;
d) provide guidance for use of Renovate® OTF for Eurasian watermilfoil control on the Pend Oreille River.

Renovate® OTF – On Target Flakes Aquatic Herbicide

Renovate® OTF contains the active ingredient (ai) triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid; ai triethylamine salt 14.0%) on a dry carrier (clay flake). The product is registered by the USEPA and the Washington Department of Agriculture (WDA) for use in aquatic sites to control various invasive plants, such as Eurasian watermilfoil. Triclopyr is an auxin-like material that is selective for control of broadleaf plants or dicots. Research has shown that this herbicide and its metabolites have an environmentally compatible degradation scenario and excellent toxicological profile, and

the ability to selectively control a variety of exotic weed species, making it a valuable tool for restoring and managing aquatic ecosystems.

Evaluation Sites:

Four sites, 10 acres in size, infested with Eurasian watermilfoil on the Pend Oreille River (between Newport and Ione, WA) will be selected for the evaluations. Three of the four sites will be treated with Renovate® OTF. Selection of sites will be in coordination with the Pend Oreille County Noxious Weed Coordinator (POCNWC), and appropriate personnel from the Washington Department of Ecology (WADOE), Public Utility District (PUD) No.1 of Pend Oreille County, and the US Army Engineer, Seattle District. Treatment sites will be permanently established and recorded using GPS technology. Water depth contours will be determined to calculate herbicide treatments. Three sites will be treated with Renovate® OTF and one site will remain as an untreated reference (check) site.

Treatment Rates and Application Techniques:

Herbicide rates used in the evaluations will be based upon estimates of water exchange conditions in the selected sites and matched with triclopyr concentration/exposure time (CET) relationships that have been established under replicated growth chamber and mesocosm conditions (Netherland and Getsinger 1992; Sprecher et al. 1998; Getsinger et al. 2003). Aqueous application rates will likely range from 0.75 to 2 ppm, and will not exceed the maximum rate approved on the USEPA Section 3 label (2.5 ppm), and/or approved by the Washington Department of Agriculture (WADA). Applications will be made in summer (July-August), when discharge from the Albeni Falls Dam has reached a level that will not cause excessive dilution of the herbicide, but prior to plant canopy formation on the water surface. The product will be applied using a mechanical herbicide spreader, mounted on a boat, and in accordance with all label directions and restrictions. Application permits and treatment notification will be coordinated and/or obtained by the POCNWBC's office, and all posting of treatment sites will be in accordance with regulations of the WADOE.

Vegetation Assessments:

Pretreatment and 6 to 8 week post treatment assessments of the vegetative communities will be conducted at each site using a quantitative point-intercept method (Madsen 1999). Assessments will determine plant species occurrence and abundance (biomass) in the plots, including percent control of Eurasian watermilfoil. Data will be statistically analyzed and used to compare treatment effects.

Triclopyr Water Residues:

Water samples will be collected in three locations (mid-depth) in each plot permanently marked with GPS technology), and at 3 selected stations downstream of treated plots, to determine the amount and dissipation of triclopyr, within and from, the treated areas. Samples will be collected in duplicate at pretreatment and 1, 3, 6, 12, 24, 48, 72, 96 and 168 h (7 days) post-treatment. In

addition to the mid-depth samples, a bottom sample and sub-surface sample will be collected 1, 6, 24, 48 and 72 hours? post treatment to determine vertical distribution of triclopyr in the water column. Samples will be frozen and shipped to SePRO Corp. for analyses of triclopyr using approved immunoassay techniques. This information will be used to field-verify CET relationships of triclopyr against Eurasian watermilfoil previously developed in the laboratory, and to determine the aqueous dissipation profile downstream from treated sites. This dissipation profile can be used to predict where residues fall below the level of drinking water concern (0.4 ppm), and provide information on potential impacts to irrigation water intakes.

Review of Study Plan:

The study plan will be reviewed by all appropriate agencies involved with management of Eurasian watermilfoil on the Pend Oreille River, including the POCNWCB, the WADA, the WADOE, the PUD No.1, the US Army Engineer District, Seattle, and appropriate personnel at the Albeni Falls Dam Project Office. In addition, the USEPA Office of Pesticide Programs (Washington, DC) will be consulted for input into study design and implementation.

Why This Particular Herbicide Was Chosen

There are two classes of herbicides that could be used for the project; contacts and systemics. The contacts are useful to rapidly knock-down standing vegetation (shoots), but usually they do not provide complete control of mature plants - because rootcrown and root tissue has not been killed. Therefore, plants treated with contact herbicides usually re-grow from the unaffected tissues.

In contrast, systemic herbicides are translocated to all actively growing points (shoots, roots, and rootcrowns) and can provide complete control of plants - in most cases > 90% of treated plants - because shoot, rootcrown and root tissue has been killed. There are three systemic herbicides registered in Washington State that are effective for controlling Eurasian watermilfoil : fluridone, 2,4-D, and triclopyr. All of these products can also provide species-selective control of Eurasian watermilfoil, with little injury to non-target native plants. Because of these reasons, a more complete control combined with a species-selective control method was chosen for this project.

Fluridone was not selected for the project because it requires an extended aqueous contact time in association with Eurasian watermilfoil to achieve adequate control (60-90 days). While the Pend Oreille River is impounded and water-exchange half-lives in plant stands are much slower (t 1/2 = 6 to 60 hr) than in free-flowing rivers, it would be very difficult, time-consuming and expensive to maintain lethal fluridone levels in the water for 60-90 days.

There is little question that granular 2,4-D would work well in some plant stands in the river. However, there is still reluctance from some of the public to use this product in aquatic sites.

That leaves triclopyr. The new clay granule formulation, Renovate OTF (On Target Flake), has been designed to sink through the water column, hang-up in the vegetation, and deliver the herbicide in close contact with plant shoots and rootcrowns, thereby providing maximum uptake

and rapid distribution to all growing points of EWM. In slow-flowing waters (like the Pend Oreille) this should provide better Eurasian watermilfoil control than the liquid can provide. But there is a need to verify and document that control in a real-world setting. There is also a great interest from the public and agencies in the Pacific Northwest to evaluate new Eurasian watermilfoil control tools, including herbicides like Renovate OTF.

Results from our project will provide guidance for use of Renovate OTF in the Pend Oreille River and similar water bodies in the Pacific Northwest. It will provide important information on how to effectively use another Eurasian watermilfoil control tool.

2.2 Alternative B- Control or Eradication by Insect Herbivores

Alternative B considers the use of a biological control by augmenting the existing population of the naturally occurring North American aquatic weevil (*Euhrychiopsis lecontei),* a herbivore on watermilfoil. Studies have demonstrated that this native insect has been found in Washington State feeding on both Eurasian and Northern watermilfoil (*Myriophyllum sibericum)* and in this case is quite selective (Washington Department of Ecology website- "Eurasian Watermilfoil-A Problem Aquatic Plant in Washington"). This method usually works by raising a large amount of weevils in a controlled environment and than they are released into an area at the right time of year to augment the existing native population. The larvae of the weevil are attached to the plant in large numbers and potentially effect in viability of milfoil by reducing the buoyancy of the plant and dragging it down. While this may sound simple, it is not. To cause a measurable effect on milfoil, large numbers are needed. Also, the water temperature during the larval growing season is critical. If the water temperature is to cool then the biomass of the weevils that are needed to provide effective control will not be achieved.

Augmentation of weevils in Washington State is at an early and experimental stage. Currently, the State of Washington's Department of Agriculture has not approved a permit to import and release weevils and any permit issued would be for experimental use only (Kathy Hamel, Washington Department of Ecology in a Panel Discussion" Management of Eurasian watermilfoil in the United States Using Native Insects: State Regulatory and Management Issues" 2000.). There have been a few test cases with the weevil in Washington State, most notably The Box Canyon Project Aquatic Plant Containment Pilot Studies, 2000-20002 by Framatome ANP of Bothell Washington. They report less than spectacular results over a two year test. There could be a number of factors for the poor results including, temperature, insufficient biomass and the like. There are efforts to commercially raise large volumes of weevils in Idaho for milfoil control so there may be some hope of this as a viable management tool in the near future but right now biological control using weevils seems premature. The fact that the Pend Oreille River is an open system and not enclosed such as a lake, the cool water temperatures during the weevil growing season and the inability to raise large numbers in a short time are all reasons Alternative B was not chosen.

2.3 Alternative C- Control or Eradication by Grass Carp

Plant eating fish have been employed in Washington State to sometimes control aquatic weeds. Usually, a sterile, triploid grass carp is planted in lakes. Carp have been successful in small

ponds or isolated lakes especially for controlling hydrilla (a noxious aquatic weed). Water temperature, stocking rates, the type or species of aquatic vegetation all have an effect on the success of using Carp. If Eurasian watermilfoil is the target, all other plants may be eaten first, and grass carp may in fact never completely remove Eurasian watermilfoil (Fowler, M.C, and Robson, T.O. (1978). History and development of aquatic weed control in the United States. Reviews in Weed Sciences 5, 115-192). In addition, there are many concerns about using grass carp, including the length of time they remain in the system, the difficulty of controlling where and what they eat (non-selective), the escape of carp from a managed area and the difficulty of removing them when they are no longer needed (Bonar, S.A., Vect, S.A et. al. 1993).

Do to the fact that grass carp are not very selective and will not target Eurasian watermilfoil (low chance of success) and their potential to escape the Pend Oreille system, Alternative C was not chosen.

2.4 Alternative D- Control or Eradication by Mechanical Methods

Mechanical eradication includes both physical and mechanized means and covers a wide array of plant control types. Techniques such as hand cutting or pulling, harvesting, diver operated suction (diver operated venturi pumps attached to a hose with a cutter head), and rotavating are examples of mechanical techniques. While dredging, drawdown of the Pend Oreille River during winter, and shading illustrate the types of actions that are physical in nature. Many of these methods are easily removed from further consideration for the following reasons.

Drawdown of the Pend Oreille during the coldest time of the year such as January was not considered because of the potential impacts to the endangered bull trout and other fish. This would be the time of year when the bull trout and other cold water related fish could be found in the mainstem. Water born transportation and navigation would be similarly affected. A test case of drawn down on Campbell Pond which is adjacent to the Pend Oreille was attempted in January of 2005 with no success, Eurasian milfoil may be able to handle the low winter temperatures (The Box Canyon Project Aquatic Plant Containment Pilot Studies, 2000-2002).

Similarly, hand cutting, diver operated suction devices, and shading were eliminated from consideration. While these different techniques are effective on a small impoundments or new invasions and at a site specific scale, the logistics and cost to apply them over the 3,000 acres of Eurasian watermilfoil in Box Canyon would be prohibitive.

Typically dredging, also includes removal of bottom sediments and is accomplished by clam shell buckets, hydraulic cutterhead, dragline or similar devices. It is a large scale operation and is not very selective, removing what ever is in its path. Dredging is usually a big operation that attempts to accomplish multiple tasks such as excavating out a navigation channel while removing aquatic vegetation. Because dredging is such an imprecise operation, there is a high probability of leaving behind fragments of Eurasian watermilfoil as well as roots allowing the plant to re-sprout or propagate from the remaining plant parts. There is also a high probability of entraining fish and impacting their habitat. For the previously stated reasons this technique was no longer considered.

There is one mechanical method that is frequently used in Box Canyon, on Eurasian watermilfoil and that is rotovation. A rotovator uses underwater rototiller-like blades to uproot aquatic plants. The rotating blades till seven to twelve inches deep into the lake or river bottom to dislodge plant roots. The plant fragments and root crowns float to the water's surface. Plants and roots may or may not be removed from the water using a weed rake attachment to the rototiller head, by a harvester, or by manual collection. Rotovation was developed in British Columbia by milfoil managers looking for a non-chemical management technique that provided longer term control than harvesting.

Because rotovation disrupts the sediment, it can create harmful environmental effects:

- Rotovation churns up the lake bottom causing water to become temporarily turbid with suspended sediments.
- Plant nutrients in the sediments, such as nitrogen and phosphorus, may be released into the water.
- Long-buried toxic materials in the lake or river bottom which may be present from land use activities such as boat building, storm water drainage, or combined sewage outfalls may be released into the water.
- Rotovation may interfere with fish spawning or migration.

Although rotovation is used in British Columbia and on the Pend Oreille River in Washington, rotovation has not become a popular method of plant control in other areas.

Advantages

- Rotovation potentially removes the entire plant rather than just "mowing" off its top like harvesting and cutting.
- Plant density is generally decreased by successive treatments.
- Control typically lasts two growing seasons.
- Rotovation can be used year-round to control aquatic plants, depending on permit requirements.
- Rotovators can remove plants from a greater water depth than can harvesters.
- Rotovation may stimulate growth of some desirable native aquatic plants.

Disadvantages

- Rotovation is expensive.
- Rotovation disturbs bottom dwelling (benthic community) animals. Many of which are food sources for fish.
- Rotovation causes fragmentation which may increase the spread of invasive weeds like milfoil.
- Rotovation is labor intensive. It may require cutting the plants and removing bottom obstacles like logs and rocks.
- Underwater utilities, such as gas, water, sewer, telephone or water intake pipes, need to be located before rotovation begins.
- Rotovators can leak fuel and hydraulic fluid into the water.

- Rotovation is non-selective in regards to which aquatic plants it removes.

The Source for this information on rotovation was The Western Aquatic Plant Management Society website http://www.wapms.org/management/rotovation.html and Madsen, J.D. 2000. Advantages and Disadvantages of Aquatic Plant Management Techniques.

Rotovation is imprecise, substrate type, the condition of the equipment, skill of the operator, weather conditions and other variables can all have an impact on the effectiveness of the operation. Eurasian watermilfoil will readily recolonize rotovated sites if the substrate is incompletely tilled. Rotovation effectiveness in the Pend Oreille River has been variable. While stem density of Eurasian watermilfoil and other aquatic macrophytes are effectively reduced by rotovation, re-colonization rates vary widely. ("Interim Aquatic Plant Management Plan for the Pend Oreille River" 2003.).

Another concern with rotovation is the potential to disrupt cultural resources. Cultural or archeological resources that are located in near-shore areas run the risk of being disturbed by the rototilling action of the equipment.

For this evaluation, the disadvantages and potential impacts of rotovation outweigh the benefits. This alternative was not chosen due to the non-selectivity of rotovation, cost (equipment, operation and maintenance), and the potential impacts to fish habitat and associated prey resources, the variability in effectiveness and water quality impacts.

2.5 No Action Alternative

Under the no action alternative, no Eurasian watermilfoil eradication measures would be taken under the Aquatic Plant Program by the Corps of Engineers in the Box Canyon area of the Pend Oreille. The current estimate of 3,000 acres of Eurasian watermilfoil would remain the same or would be addressed by some other entity (such as Pend Oreille County). The Pend Oreille County currently rotovates and root-rips a minimum of 200-300 acres annually. No evaluation would take place to see if the proposed control method (application of triclopyr, flake) worked or not. If no action is taken, it could be expected that Eurasian watermilfoil could spread further, impairing recreation activities such as boating and swimming and fisheries habitat such as feeding and spawning areas. In this situation, doing nothing does not seem prudent. Eurasian watermilfoil has had a demonstrated negative effect on the waters of Box Canyon in the Pend Oreille. The U.S. Army Corps of Engineers has the authority and means under their aquatic plant control program to evaluate potential control methods as well as the resources to implement a pilot study during this year.

3 EXISTING ENVIRONMENT

The following sections discuss the current environmental status of the project area. Sections 4, 5, and 6 discuss the potential, adverse, and cumulative effects of the proposed action, respectively.

3.1 Climate, Hydrology and Geology

Box Canyon (from Box Canyon Dam (River Mile (RM) 34.4 to Albeni Falls Dam RM 90.1) is located on the mainstem of Pend Oreille River. The Washington State towns of Cusick, Usk and Newport are located adjacent to the River within Box Canyon. The climate of this area can be generalized by warm and humid summers and cold winter where significant snow is to be found in the surrounding mountains at elevation. In the winter, storm fronts from the Pacific sweep through depositing snow and rain depending on the elevation and associated temperature. Amounts of precipitation vary widely over the area depending on season, elevation, aspect and location. The average temperature range for Newport Washington is between 20º F and 80º F. The average precipitation is 24 inches a year. The growing season averages 120 days per year.

Snow melt provides the predominant source of water on the Pend Oreille River. Late spring and early summer are when the peak flows occur due to runnoff. There are two hydroelectric dams that manipulate water levels in Box Canyon and utilize this resource for power generation. Albeni Falls dam is located at river mile 90 and is operated by the U.S. Army Corp of Engineers. Box Canyon dam is located farther downstream at RM 34 and is operated by Pend Oreille Public Utility District. Consequently, this stretch of Pend Oreille River is regulated.

The geology of the Pend Oreille basin is similar to that of the Rocky Mountains. About 150 million years ago tectonic activities caused compression that started the rise of this mountain range. Rock types that are typical of this area include argillite (a metamorphic mudstone hardened by pressure) quartz and granite. For the next hundred million years additional tectonic events and volcanism dominated the landscape, folding and stretching the earth with occasional releases of magma. It was these types of processes that provided many of the mineral deposits that are found in the area. The last major land forming activities occurred from 20,000 years to 9,000 years ago as a result of glaciation and glacial retreat. Long deeply incised valleys were carved out. Retreating ice facilitated the creation of Lake Missoula which eventually emptied in a major event that sent hundreds of feet of water down through the valleys scouring everything in its path.

3.2 Water Quality

Water quality in the Pend Oreille has been a concern for the past many years. A number of State Federal, County and Tribal agencies conduct regular water quality testing. Agriculture, dams, mining and forestry have all played a part in affecting water quality. Since Box Canyon is regulated with dams at both ends, water temperature is a big concern. Currently there are two total daily maximum load (TMDL) studies being conducting in Water Resource Inventory Area (WRIA) 62. One TMDL is for temperature and one for dissolved gas (as a result of dam operations). PCBs and Aldrin (an insecticide) are also a concern in fish tissue for the area and show up on the 303(d) list for EPA's impacted waters. Water column chemicals of concern that show up on the 303(d) list include DDT by products, Heptachlor, Epoxide, Heptaclor, Aldrin, Dieldrin and Endrin. (Washington State Department of Ecology. 2005 "Verification of 303(d) Listings for Fish Tissue in the Skagit and Pend Oreille Rivers"). Many of these products are associated with agricultural runoff. Eurasian watermilfoil is also considered a major water quality concern for Box Canyon. The city of Newport and Cusick discharge secondary waste into the Pend Oreille.

3.3 Vegetation

The prevailing upland vegetation type surrounding Box Canyon consists of interior mixed coniferous forest with scattered stands of deciduous trees in the moist lowland areas adjacent to the river. Most of the shoreline and moister, shadier, landward area consists of remnant cottonwood, birch, western red cedar, and western hemlock, while Douglas-fir, western larch, western white pine, and lodgepole pine are more common in the drier areas. Lodgepole pine and mixed conifer species dominate at higher elevations. Much of the forest is second growth. Agricultural lands, particularly pastoral meadows, have been developed on the once-forested flatlands. A large floodplain and wetland area is located on the mainstem near the confluence of Trimble and Tacoma creeks.

There are a variety of both native and non-native aquatic vegetation in the Box Canyon Pend Oreille River area. Aquatic plants tend to be sparse in deeper waters or in areas with coarse gravel or cobble substrate. Three species dominate the aquatic flora in Box Canyon. Eurasian watermilfoil and curlyleaf pondweed are capable of dense growth within the 0 to 13 feet range but limited at deeper depths. The native waterweed (*Elodiea Canadensis*) is most prevalent within the surf zone at the waters edge. Several species of *Potamogeton* (pondweed) can be found in the area, as well as Coontail (*Ceratophyllum demersum*). No known aquatic plants in Box Canyon on the Pend Oreille River are State or Federally listed as endangered, threatened, sensitive or species of concern ("Interim Aquatic Plant Management Plan for the Pend Oreille River" 2003. Prepared by Pend Oreille County).

3.4 Fish

Box Canyon on the Pend Oreille is home to a variety of native and non-native fish that support a recreational and sports fishery. Local species include the bull trout, rainbow trout, peamouth, cutthroat trout, bass, whitefish, perch, sunfish, largescale sucker and walleye. Many of these species have been introduced or supplemented. For instance brown trout were first introduced as far back as the 1890s. While rainbow and cutthroat were supplemented from the 1930s'to 1950s. The Kalispel Tribe operates a largemouth bass hatchery at the Flying goose ranch. Currently, cold-water species such as rainbow and cutthroat trout are only occasional seen while the bull trout is listed as a threatened species.

Bull trout, rainbow trout, and other cold-water salmonids are probably able to inhabit the smaller areas of the warmer Pend Oreille River by utilizing cold water refuges provided by cooler tributaries at the confluence to the mainstem. Warm water species, such as perch and sunfish, are more prevalent in the littoral areas of the Pend Oreille River. One factor that contributes to lower than expected populations of fish in the Pend Oreille is limited over-wintering habitat for the warm-water species (bass, sunfish ect.) and warm water during the summer months impacting the cold-water species (bull, rainbow, and cutthroat trout).

3.5 Wildlife

Wildlife (vertebrates) in the Pend Oreille area includes a mix of mammals, amphibians, birds and reptiles. Many of the species are found in upland forest, riparian habitats or associated with the river and its tributaries (Threatened and endangered species are discussed separately in Section 3.6). Typical waterfowl present include both migrants and winter resident; Canada geese,

Mallards, three species of teal, widgeons, coots, and pied-billed grebes are prevalent. Other aquatic associated birds are; merganser, herons, kingfisher and the American dipper.

Birds of prey such as hawks, owls, osprey, and bald eagles are also associated with Pend Oreille and the riparian locations. The area contains several bald eagles that both winter over and nest in the proximity. Other common birds are, thrushes, pheasant, starlings crows, grouse, flycatchers, woodpeckers and mourning dove.

Upland mammals include white-tail and mule deer, black bear, coyote, porcupine, skunk, squirrel, raccoon mice, bats, woodrat and fisher. Aquatic associated species are, muskrat, mink, beaver and otter.

Common amphibians and reptiles include; salamander, frogs, toads, a variety of snakes, lizards and turtles.

3.6 Threatened and Endangered Species

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (Title 16 USC, Chapter 35, Section 1536(a)2), as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Several threatened or endangered species that may be found near the proposed project area are listed in Table 1.

Table 1. Threatened and Endangered Species for Box Canyon on the Pend Oreille River

Common Name	Scientific Name	Listing Status
Gray wolf	*Canus lupus*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened
Bull trout	*Salvelinus confluentus*	Threatened
Lynx	*Lynx canadensis*	Threatened

Bald eagles and bull trout are known to occur in the vicinity of the project. The gray wolf, Ute ladies'-tresses, wolverine, and lynx do not have sufficient habitat to occur within the project vicinity.

3.7 Native American, Cultural, and Historic Concerns

Regarding Native American concerns, the proposed project area is within the lands ceded by the Kalispel Tribe of Indians. Two of the sites are close to but not within the boundaries of the Kalispel Reservation. The Kalispel Tribe is concerned about measures to control noxious aquatic vegetation that have potential to affect fish and wildlife and ecosystem health, including effects on bull trout and other resident species. In addition, they are concerned with measures that may adversely affect historic properties that might be present within areas proposed for treatment.

3.8 Land Use

Much of the land surrounding Box Canyon is in National Forest including the Colville and Kaniksu to the north and east. The Kalispel Tribe has reservation lands that border both banks of the Pend Oreille. There are some small towns adjacent to the River, most notably Newport, Cusisk and Usk. The majority of flood plain areas next to the river are in agriculture. There is some mining activity in the area of Metaline. Upstream of Box Canyon, Albeni Falls is owned and operated by the U.S. Army Corps of Engineers. Downstream, Box Canyon Dam is owned and operated by Pend Oreille Public Utility District.

The majority of land is in Federal ownership followed by private, State and Tribal. Pend Oreille County contains about 896,000 acres of land or 1,400squre miles, 65% is in Public Ownership (Forest Service (59%), Bureau of Land Management 0.2 %), the County(1.2%), Washington State (3.8%) and Tribal Lands (0.8%)) and 35% is private ("Pend Oreille County Community Wildfire Protection Plan (CWPP)" 2005, developed by the Pend Oreille County Interface Wildfire Mitigation Plan Committee in cooperation with Northwest Management ,Inc.).

3.9 Recreation

The recreation industry is very important for the local and county economies. Power boat cruising, fishing, sight seeing, water skiing, kayaking, snow skiing, hunting, camping, and bird watching are all important recreational activities. There are several boat landing, fuel docks and marina in Box Canyon stretch of the river.

3.10 Air Quality and Noise

The proposed project area is currently in compliance with federal, state, and local air quality regulations. The area is not designated a Class I or Class II area as defined by Section 162 of the Clean Air Act (42 U.S.C. § 7472). Occasional forest fires can affect the surrounding air quality when they occur.

Noise factors in the project area are mainly from power boats and occasional heavy machinery.

3.11 Transportation

There is moderate (0.7 to 1.7 miles or road per square mile) road density occurring in the area around Box Canyon. Most of these roads are associated with logging, agriculture, mining, residential and State and Federal highways.

3.12 Aesthetics

Much of the area surrounding Box Canyon is visually pleasing. Forested mountain slopes, rolling hills provide many vistas. The surrounding valley is bisected by the Pend Oreille River and associated ponds, sloughs and lakes. Past logging and agriculture has left some of the landscape fragmented. There are some negative opinions associated with dense areas of milfoil that are found in Box Canyon.

3.13 Socio-Economic

Pend Oreille County is lightly inhabited with a population of over 13,000 people. The largest population center is the Newport area. The majority of this information was obtained from the "Pend Oreille County Community Wildfire Protection Plan (CWPP)" 2005. The average median income for Pend Oreille county is $31,677. There are a significant amount of families (13.6%) below the poverty level as of the 1999 Census. The unemployment rate in 1999 was 5.1%. Major occupations within the County included;

1. Management, professional and related occupations 26.8%
2. Sales 20.7%
3. Farming, fishing and forestry 2.5%
4. Construction related 13.3%
5. Agriculture and related 5.6%
6. Finance 4.0%
7. Manufacturing 13.9%
8. Transportation 9.3%

Ethnicity from the 2000 Census showed that 93.5% of the population was considered white, black or African American 0.1%, American Indian or Alaska Native 2.9%, Hispanic or Latino at 2.1%.

3.14 Hazardous and Solid Waste

No known hazardous or solid waste is stored or evident in the immediate vicinity of the proposed project areas. Historically, there were several mining operations that occur in the Metaline area, several of these sites show up on the Department of Ecology "facilities" database that includes hazardous waste generators or clean up sites. There is a MTCA site at the Lehigh cement factory at Metaline Falls, kiln dust is causing high pH as it enters Sullivan Creek. These areas are well down river from the proposed project area.

4 ENVIRONMENTAL EFFECTS

4.1 Climate, Hydrology and Geology

No effects are expected to the local climate, hydrology or geology from the application of the herbicide Triclopyr (in the form of Renovate® OTF) at the three test sites. No application will occur at the control site.

4.2 Water Quality

The project, as proposed, is to apply the herbicide Triclopyr (in the form of Renovate OTF On Target Flake) at three 10 acres sites. Aqueous application rates will likely range from 0.75 to 2 ppm, and will not exceed the maximum rate approved on the USEPA Section 3 label (2.5 ppm), and/or approved by the Washington Department of Agriculture (WDA). Herbicide applications will be made in summer (July-August), when discharge from the Albeni Falls Dam has reached a level that will not cause excessive dilution of the herbicide, but prior to plant canopy formation on the water surface. The product will be applied using a mechanical herbicide spreader, mounted on a boat, and in accordance with all label directions and restrictions.

The Washington State Department of Ecology has prepared a Environmental Impact Statement (EIS) for the Permitted Use of Tricolpyr and a Supplemental EIS Assessments of Aquatic Herbicide Volume 5 Triclopyr. Much of the following information comes from these studies unless otherwise noted.

Persistence. The persistence of triclopyr and its degradates varies widely depending on the conditions of the system being tested. For the most part triclopyr is dissipated rapidly from the water column and is not adsorbed on the sediments for very long periods. The dissipation half-life in water of triclopyr products varies from less than one day to approximately seven and one half days. However, according to most authors, the typical half-life is between three and one half days and seven and one half days. Dissipation of triclopyr is primarily due to photolysis, degradation by microbes and mixing (dilution).

For a triclopyr, herbicide application project on the Pend Oreille River in 1991 with similar concentrations proposed as this project, Getsinger found whole-plot treatments ranged between 3 ppm to 0.2 ppm within 24 hours. After three days the range for all plots was below detection limits to 1 ppm. After seven days the highest concentration found was 0.3 ppm with half of the test plots below the detection limit (Getsinger K.D., et.al. 1997). These are concentrations that are within the treatment area. The same study found that with proper analysis and application triclopyr concentrations outside treated areas can be maintained at levels that are extremely low or below detection, and that proposed potable water tolerance set back distances of 400-800 meters (2600 to 1300 feet) are adequate (Getsinger K.D., et.al. 1997). . The dissipation rate of the herbicide will be measured as part of the monitoring program for the preferred alternative.

As the milfoil plants die and decompose there may be a slight reduction in dissolved oxygen and small increase in phosphate and nitrogen in the water column due to decomposition. In time this will be offset as native plants are no longer suppressed and are expected to resettle these test areas producing more dissolved oxygen and utilizing available nitrogen and phosphate for plant growth.

4.3 Vegetation

The entire purpose of the proposed alternative (application of the selective herbicide triclopyr) intends to alter the vegetation at the three test sites (there will be no action other than sampling at the control site). The intent is to reduce as much as possible the invasive Eurasian watermilfoil while improving conditions for the native aquatic vegetation. Eurasian watermilfoil can dominate and suppress the native aquatic community.

If the proposed alternative is realized, it is expected that the species composition, species richness and species frequency will change. While the Eurasian watermilfoil and curlyleaf pondweed will be greatly reduced, it is expected that the number of monocot and dicot native species will increase. In a similar study conducted in Box Canyon in the early nineties, using the same type of herbicide, it was demonstrated that triclopyr can be used to control selectively the exotic weed Eurasian watermilfoil in coves and along shorelines in regulated rivers, while restoring diverse native submerged plant communities in these sites. Such native communities can delay the re-establishment of problematic levels of milfoil for up to three growing seasons. (Getsinger K.D., et.al. 1997).

The Department of Ecology concluded: "Sensitive non-target aquatic species of plants are not likely to be affected by triclopyr concentrations of 2.5ppm or less (this is the level targeted in the pr opposed alternative). (Department of Ecology. 2004. Final Supplemental EIS for Triclopyr.)

One a similar study in 1991 in Box Canyon (Getsinger, K.D. 1991) found that native plant biomass levels responded dramatically to the removal of milfoil. Although native plant biomass remained low four weeks after the application, it increased dramatically (500-1000%) in the treatment areas one year after treatment. The study concluded that selective control of milfoil resulted in higher abundance of native plants up to two years after treatment and that this restoration of a more native plant community can delay the reinvasion and dominance of an aggressive and opportunistic weed. The main component in the restoration of plant diversity was the monocot species such as *Potamogeten* sp.

4.4 Fish

Potential impacts to fish were considered during the planning of this proposed action. One reason for choosing the herbicide triclopyr was its low toxicity to fish. The Final Supplemental EIS for Triclopyr conducted by The Washington State Department of Ecology stated:

Most Triclopyr TEA appears to be safe for use in aquatic ecosystems. When comparing to typical expected environmental concentrations of triclopyr with laboratory LC_{50s}, the highest concentration that may be encountered immediately after application(2.5 ppm for control of submerged weeds) may affect more sensitive species (like mollusks for example). *Fish and non-mollusk species would not be adversely impacted by these concentrations of triclopyr TEA. For example, the most sensitive fish species is rainbow trout with a 96- hour LC_{50} of 82 ppm and the most sensitive non-mollusk invertebrate is the red swamp crayfish with a 96- hour LC_{50} of > 103 ppm. Since these species have LC_{50s} that are >10-fold greater than the expected environmental concentrations that occurs immediately after application, it is not likely that they would be adversely impacted by the effects of triclopyr TEA.*

In regards to bioaccumulation and potential impacts to the food chain, existing studies indicate that triclopyr presents little risk. Volume 5-Triclopyr, Section 4- Environmental Effects by the Washington Department of Ecology provides the following information:

Triclopyr has a slight tendency to accumulate (up to 10 fold) in target plants. Triclopyr does not accumulate in sediment, not target plants, fish, shellfish, mammals or birds. Since the bioaccumulation factor in all cases is ≤ 10-fold, triclopyr is non-accumulative according to the work of Weber.

The next paragraph continues with:

Since the concentrations of triclopyr in plants has not been reported higher than 19 ppm after treatment and water volume is great compared to the plant volume, the release of triclopyr after plant death is not anticipated to cause further impact on aquatic plants or animals. Bacteria and other microbes in the water column and sediment metabolize triclopyr and it metabolites to

carbon dioxide, water and various organic acids. However, mixing with untreated water in open waterways and photolysis also influences the dissipation of triclopyr and it metabolites by sunlight in shallow waterways with limited plant cover.

Potential impacts to some fish and aquatic life are further reduced when considering the timing of the application. The proposed project is schedule to occur in July or August depending on river conditions. By this time water temperatures are relatively warm (with exceedences of over 20^0 Celsius not uncommon) which will facilitate microbial degradation. It is also expected that some of the more cold water associated fish such as rainbow, cutthroat and bull trout will not be found in the project area due to high water temperatures.

4.5 Wildlife

If the proposed alternative is implemented, little or no impact is expected to wildlife. The following was taken from "A Review of the Toxicity and Environmental Fate of Triclopyr" 2004. by Antunes-Kenyon, S.E and Kennedy, G..;

***Mammals**: Studies reviewed show that triclopyr acid is practically non-toxic to small mammals on an acute oral basis.*

***Birds**: Triclopyr presents low acute and subcronic toxicity to the bird species tested. According to the 1998 EPA RED, reproduction of birds may be affected at levels greater than 100ppm of triclopyr TEA. Waterfowl are likely to be the most highly exposed bird species, given that they swim, drink and feed on lakes and ponds proposed for treatment with Renovate 3. Given the maximum expected environmental concentrations of 2.5 ppm, the rapid degradation in treated water, and the lack of bioaccumulation, there are negligible risks to avian species including those whose diet might consist primarily of aquatic vegetation treated with triclopyr.*

In summary, strict adherence to Renovate 3 labeling, will result in minimal acute and negligible chronic risks to most fish, waterfowl, amphibians and aquatic invertebrates from triclopyr TEA and its metabolites.

Expected concentration within the test site is between 2.0 and 0.75 ppm. Well below the concentration where effects would impact most species.

4.6 Threatened and Endangered Species

A few threatened or endangered species that may be found within a few miles of the proposed project area and are listed below in Table 2. The degree to which the proposed project may affect those species and the rationale used to make those determinations are also summarized in Table 2. A more detailed explanation of the rationale for the determinations can be found in the Biological Evaluation (BE) for this project.

Table 2. Effects on Threatened and Endangered Species of Box Canyon on the Pend Oreille River

Common Name	Listing Status	Effect Determination	Rationale
Gray wolf	Endangered	Not likely to adversely affect	No packs in the project vicinity
Bald eagle	Threatened	Not likely to adversely affect	Work will take place after mating and rearing times. No known nests or communal night roosts in the immediate project vicinity
Ute ladies'-tresses	Threatened	Not likely to adversely affect	None located within the project vicinity and no suitable habitat at the proposed project site
Bull trout	Threatened	Not likely to adversely affect	Work will occur during the summer months when the water temperatures are prohibitive.
Lynx	Threatened	No affect	No known occurrences in or near the project vicinity

Although the project is not likely to adversely affect bald eagles, bald eagles are known to nest, overwinter, and feed in the general area near the project site. The timing of the project is well out of the period when bald eagles are expected to mate, nest or rear their young. Additionally, there is little chance of ingestion of the herbicide triclopyr due to the fact that bald eagle are not herbivorous, there is no bioaccumulation in prey species (see section 4.4 Fish) and triclopyr degrades rapidly.

Bull trout would most likely be the other species of concern. Very few bull trout have actually been observed in Box Canyon in recent years. There is only a slight probability that bull trout will be in the area during the proposed application of the herbicide. By July and August, water temperatures will probably be exceeding 20^0 Celsius and bull trout will not likely be present. Even if there was a chance of exposure, at the concentration proposed for this project (2ppm or less) no toxicity is anticipated (see section 4.4 on Fish).

The Biological Evaluation (BE) for this project was sent to the U.S. Fish and Wildlife Service on May 10, 2007. In a letter dated June 13, 2007 concurred with the Corps opinion that the project will not likely to adversely affect Bald eagles, Bull trout and designated Bull trout critical habitat.

4.7 Native American, Cultural, and Historic Concerns

The proposed activity will take place at three proposed treatment sites (figures 1a,2b,3c). Although archaeological inventories have taken place near the treatment sites (e.g. Salo 1988), resulting in records of 15 archaeological and other sites comprising potential historic properties within 500 meters of the proposed treatment sites, none of the treatment sites has been specifically inventoried for historic properties (Washington Department of Archaeology and Historic Preservation database, April 2007). The areas that may potentially be affected ("APE") by the treatment alternatives are limited to the polygons identified in figures 1a,2b,and 3c. No properties (sites) listed on the National or State Register of Historic Places are present in or near the polygons as of September 2006 (*http://www.dahp.wa.gov/pages/HistoricSites/documents/HistoricPlacesinWashingtonReport_000.pdf*). The proposed treatment sites all are on the bed of the Pend Oreille River. As they are not within the area of the pool raised by Box Canyon Dam, there is little likelihood that previously inundated landforms with potential for prehistoric archaeological properties are present,

especially at sites 1 and 3. Site 2 is within a permanently inundated slough or swale; the Kalispel tribe's historical use of such areas for fishing potentially may have resulted in archaeological deposits or remnants of fishing structures in the site 2 APE, but no remains have been identified there to date. As the slough is relatively deep and permanently inundated, it is not likely (although still possible) that such remains exist there. The following table summarizes historic properties considerations for each proposed treatment site:

Table 2. Historic Properties Effects.

Site	Historic Properties	Determination
Site 1	No historic properties are known within the APE; undiscovered properties are very unlikely to exist as the landform is permanent riverbed.	Herbicide application alternatives have no potential to affect. Rotovation has potential to affect any prehistoric archaeological site that might be present in the rotovated sediments, but as no sites are likely to be present on permanent riverbed, almost certainly would have no effect.
Site 2	Several prehistoric archaeological sites are present nearby, but none are known within the APE. There is some (but low) potential for sites to exist within the APE.	Herbicide application alternatives have no potential to affect. Rotovation has potential to affect, and if selected for treatment, would require archaeological survey of the proposed impact area at lowest water.
Site 3	The site is within the boundary of a timber-industry related historic archaeological site 45-PO-475, a series of pilings used to secure log rafts. Site 45-PO-408, a prehistoric archaeological temporary camp site, also is immediately adjacent to the site but is not known to extend into the APE. Undiscovered prehistoric properties are very unlikely to exist as the landform is permanent riverbed.	Herbicide application alternatives have no potential to affect. Rotovation would not affect 45-PO-475 but has potential to affect any prehistoric archaeological site that might be present in the rotovated sediments, but as no sites are likely to be present on permanent riverbed, this site has a high probability of no effect.

4.8 Land Use

The proposed application of the herbicide triclopyr will have little to no effect on land use.

4.9 Recreation

In the short term, there will be a slight impact on recreation – primarily for swimmers and fishers who may have used the test sites. Usually swimmers avoid areas with dense foliage of milfoil.

Once the project is concluded there is expected to be an over all improvement in the areas surrounding the test site as a result of milfoil being eliminated. As required by Washington State regulation, posting of treated areas will occur prior to 24 hours of application. These postings (as signs) will advise the public to stay out of treated areas for 12 hours following the herbicide application. This potential impact will be mitigated by the use of signs noting the application. The Applicator will be on-site during the process notifying any would be fishers or swimmers of what is going on and suggesting they fish or swim upstream until the herbicide dissipates.

Other recreational activities such as power boating, camping and similar activities should not be affected. On a local scale, fishing may improve in the test areas due to the loss of milfoil, re-introduction of native aquatic species and perhaps a slight increase of aquatic invertebrate species that are food resources of local fish.

4.10 Air Quality and Noise

No impacts to air quality are expected since the herbicide will be directly applied to the water column. The only noise from the project will be the power boat and application machinery.

4.11 Transportation

No effect on transportation is expected.

4.12 Aesthetics

There should be a slight improvement in the aesthetics of Box Canyon in the vicinity of the test sites as the milfoil will be dramatically reduced.

4.13 Socio-Economic

There will be no change to the socio-economic condition of Pend Oreille County as a result of this project. This project as proposed will not change the local demographics or the economy.

4.14 Hazardous and Solid Waste

No hazardous or solid waste is expected to be generated during the proposed work. The Applicator will adhere to proper protocols in both the use and disposal of any products related to the herbicide application. Any waste will be removed from the site and disposed or recycled as appropriate.

5 UNAVOIDABLE ADVERSE EFFECTS

Other than the actual application, the proposed project will be relatively low impact. A boat and compressor will be used on the day of application. There will be a boat used and divers to monitor the sites after application causing some temporary disruption to local birds and aquatic life. A truck and trailer will be used to get the boat to the various sites for the application and monitoring that will burn gas and associated emissions. To minimize risk as well for aesthetic reasons, it is recommended that swimmers and fishers avoid the areas where the herbicide is applied for a few hours until it dissipates.

6 CUMULATIVE EFFECTS

Cumulative effects are environmental effects that may occur when the results of state, tribal, local, or private actions in the project area are added to other past, present, and reasonably foreseeable future actions. In other words, the goal is to predict what additional environmental effects may occur when the effects of this project are analyzed in combination with the actions of others.

In this respect there is an anticipation that if the project is successful (cost effective, safe and effective) and triclopyr provides the results that are expected with minimal impact on the aquatic environment, that additional projects with application of herbicide triclopyr will occur in the near future. Regardless, Pend Oreille County will still continue with their aquatic weed program. Washington State Department of Ecology may try other control or eradication techniques such as use of the native aquatic weevil.

If this project works well, is safe and cost effective, the U.S Army Corps of Engineers may rely on triclopyr as one of its management tools at the Albeni Falls Project.

7 TRUST RESPONSIBILITIES

The Kalispel Indian Reservation was established by Executive Order of President Woodrow Wilson on March 23, 1914. The Kalispel Indian Reservation is located approximately 55 miles north of Spokane in Pend Oreille County. The action proposed complies with applicable statutes and regulations and is not inconsistent with the executive order.

8 ENVIRONMENTAL COMPLIANCE

8.1 National Environmental Policy Act

This Final EA has been prepared in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. § 4321 et seq), which requires federal agencies to discuss the potential environmental impacts of their projects. This EA discusses the need for the invasive aquatic weed control, the proposed action and alternatives considered, the environmental effects of the project, and the agencies and persons consulted. During the comment period only one reply was received from Pend Oreille County Public Utility District (PUD). The responses to the PUD are contained in Appendix A

8.2 Endangered Species Act

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. §§ 1531-1544), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. The BE was sent to the U.S. Fish and Wildlife Service on May 10th 2007, and the USACE is awaiting concurrence on its findings. The concurrence letter is included in Appendix A of this Final EA.

8.3 Clean Water Act , (P.L.92-500, (33 U.S.C. §§ 1251, et seq.)

There is no placement of fill or dredge material in association with this project so a Section 404 Clean Water Act permit is not needed. In the State of Washington application of an aquatic

herbicide is considered a Section 402 (NPDES) discharge that is regulated in this case by the Washington Department of Agriculture. In April 2007, the Pend Oreille Noxious Weed Control Board submitted an application on behalf of the Corps an application and agreement for coverage for aquatic noxious weed control under this program. Washington State Department of Agriculture provided an extension of coverage for this project under permit numberWAG-993000 on May 29, 2007.

8.4 National Historic Preservation Act

The National Historic Preservation Act (16 U.S.C. § 470) requires that a proposed project's effects on archaeological sites, buildings, structures, or objects included or eligible for the National Register of Historic Places be evaluated. The preferred alternative- application of Renovate® OTF Flake, will be applied to the water column. None of the work involves disruption to the soil or substrate or any impacts to structure on or potentially eligible for listing on the National Register of Historic Places. The selected alternative has no potential to affect historic properties. Therefore coordination with the State Historic Preservation Office is not needed. The USACE has been consulting with the local Tribe (Kalispel).

8.5 Clean Air Act

The Clean Air Act (42 U.S.C.§§ 7401, et seq) requires states to develop State Implementation Plans (SIP), which document strategies to reduce or eliminate the severity and number of violations of National Ambient Air Quality Standards (NAAQS), with the goal of attaining the NAAQS. The act also requires federal actions to conform to the appropriate SIP. An action that conforms with a SIP is defined as an action that will not: (1) cause or contribute to any new violation of any standard in any area; (2) increase the frequency or severity of any existing violation of any standard in any area; or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. The U.S. Army Corps of Engineers has estimated that emissions associated with this project will not exceed EPA's *de minimis* threshold levels of 100 tons/year for carbon monoxide and 50 tons/year for ozone (40 CFR 93.153(b)) based upon this criteria, the proposed project is in compliance.

8.6 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations. The potentially affected community around Box Canyon, does not have a substantial minority population but does have a low-income population.

The project does not involve siting of a facility that would discharge pollutants that could affect human or environmental health. Application of a registered herbicide under the proposed action will not negatively affect property values in the area or socially stigmatize local residents or businesses in any way. Project activities are also not expected to interfere with local Native American treaty rights, fishing, or fishery resources.

Since no adverse health or environmental effects are anticipated to result from the project, the USACE has determined that no disproportional impacts to minority or low-income populations will occur.

9 COORDINATION

The following agencies and entities have been involved with the environmental coordination of the proposed project:

- USACE, Albeni Falls Dam
- U.S. Fish and Wildlife Service (USFWS)
- Washington Department of Fish and Wildlife (WDFW)
- Washington Department of Ecology Quality (WDEC)
- Kalispel Tribe
- Pend Oreille County

The following environmental coordination items are anticipated to be included in the final EA:

- Comments and responses for the draft environmental assessment
- The 402 NPDES Certification from Washington department of Agriculture
- Concurrence of findings from the USFWS

10 CONCLUSIONS

Based on the information presented above, this federal project will not significantly affect the quality of the human environment, and therefore does not require preparation of an environmental impact statement.

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http://www.wapms.org/management/rotovation.html

APPENDIX A

Comments and Responses to the Draft Environmental Assessment

There was only one comment letter received on the draft environmental assessment. It was provided by the Pend Oreille County Public Utility District in a letter dated June 4, 2007. The following pages contain both the letter and the responses to the letter.

Pend Oreille County Public Utility District

Administrative Offices - P.O. Box 190 • Newport, WA 99156 • (509) 447-3137 • FAX (509) 447-5824
Box Canyon Hydro Project - P.O. Box 547 • Ione, WA 99139 • (509) 446-3137 • FAX (509) 447-6790

June 4, 2007

Mr. Patrick Cagney
Environmental Resources Section
U.S. Army Corps of Engineers
P.O. Box 3755
Seattle WA 98124-3755

Re: Milfoil Eradication Pilot Project, Pend Oreille River DEA May 2007

Dear Mr. Cagney

The Pend Oreille Public Utility District No. 1 of Pend Oreille County (District) appreciates the opportunity to provide comment on the Draft Environmental Assessment (DEA) (May 2007) for the Milfoil Eradication Pilot project on the Pend Oreille River. The District has been an active participant in aquatic plant management within Box Canyon Reservoir (BCR) on the Pend Oreille River. The District provides major funding to the County in support of the County's rotovation program. The District was also a key participant in the development of the aquatic plant management plan (AQMP) for Box Canyon Reservoir. This document provides guidance for the implementation of strategies to contain milfoil and other non-native aquatic plant species in BCR.

We recognize the Corps in their efforts to address milfoil in BCR and are fully receptive to alternative treatment strategies. The AQMP encourages the consideration and application of treatment alternatives as well as supporting the rotovation program.

The District is providing the following comments on the DEA.

General Comments

1. The DEA does not disclose if funding for this pilot study affects funding for ongoing aquatic plant management programs on the Pend Oreille River. Based on a meeting the District recently had with the Corps in Newport, WA the District believes that we have a mutual understanding of the need to peruse the use of both chemicals and Rotovation in the management of Milfoil in the Pend Oreille River. Both tools may well be needed to have an impact on this noxious aquatic weed. The District requests that the Corps confirm the understanding that both methods are independent of each other and that at the present the Corps policy funds studies involving chemical use only. While the District is not at all opposed to considering alternative treatments, the DEA should disclose how actions may affect other aquatic plant management programs.

2. The DEA states that the study plan will be reviewed with all appropriate agencies involved with management of Eurasian watermilfoil on the Pend Oreille River. Few of the public are aware of this proposal. The District appreciates the Corps' recent decision to provide additional opportunities to review the study plan by the public during a meeting proposed during the month of June, 2007.

Specific Comments

1. The study plan does not provide detail on the analytical approach. No detail on the application of a point intercept monitoring method to evaluate plant density before and after treatment is provided. The plan states that four study areas will be treated but there are only three sites identified on the maps. We assume the fourth site, the control plot, will be identified in the final draft. The Kelly Island plot appears to be 80 acres rather than 10 acres. It states that results will be statistically analyzed but no detail is provided.

2. What are the evaluation criteria to assess treatment effectiveness? Will follow up surveys be conducted the following year(s) to evaluate how the treatment affects Eurasian watermilfoil density and plant community composition in subsequent years? How will flow rate be incorporated into the study? Where will the monitoring stations be located relative to the study plot? The plan mentions that it is anticipated that chemical treatment will favor the establishment of plant communities dominated by native species. How will this be evaluated if no follow up surveys are completed in subsequent growing seasons?

3. If pre and post treatment data are compared, it will be important to consider temporal in-season variation.

4. Will booms or other types of containment devices be deployed to keep the chemical within the treated area? How will flow exchange be evaluated to determine the proper concentration for treatment?

5. Will signage be posted to notify BCR users on how to avoid contact with the chemical as well as avoid disturbance to the treatment area.

6. The selection of the treatment areas should avoid areas that have rotovated within the last year. The rotovation field crew should also be notified to not rotovate these areas this year or the following season or until all monitoring has been completed.

7. We suggest that the treatment site near Cusick include the public boat launch at this site. This is a well used boat launch site and a potential vector for the spread of Eurasian watermilfoil to other water bodies. Since this site also experiences relatively heavy swimmer and fishing use, the signage will be very important.

8. Several potential impacts are not mentioned. There are a number of water supply intakes for both drinking water and irrigation along the Pend Oreille River. The District operates some of these drinking water supply intakes. Areas with intakes should be avoided in the immediate treatment area and monitoring should include the Corps analyzing samples collected from the nearby downstream water intakes to ensure no contamination from downstream drift. The draft EA should include a map indicating drinking water system intakes relative to the test plots. As the Corps has and will be applying similar treatments upstream in nearby Lake Pend Oreille cumulative impacts of multiple plumes of Triclopyr are of concern to those taking drinking water from the Pend Oreille River.

9. The DEA notes that plant debris from the rotovation program can release nutrients into the water supply. The DEA should similarly evaluate what occurs to plant wasted generated from the chemical treatment? Will treated plants release nutrients to the water as they decompose? We assume the plants killed by the treatment will not be collected but allowed to drift downstream. Is this correct? Will the treated plant waste pose any aesthetic or other concerns?

10. The DEA should include a cost comparison of all the treatment alternatives discussed. The DEA notes that a disadvantage of the rotovation program is that it is expensive. Without quantifying the cost of rotovation relative to the cost of other treatments considered including the preferred alternative, there is no basis for listing cost as a disadvantage of the rotovation program.

11. The DEA appears to dwell on rotovation and lists advantages and disadvantages only for rotovation. It would provide a better comparison of the alternatives (weevils, barriers, etc.) if consistent terminology were used to list similar information for each alternative. Several of the listed harmful environmental effects of rotovation have not been noted to be problematic for the existing program on in BCR. Elevated turbidity has not been documented as water quality impairment. Turbidity levels in BCR are generally well below water quality criteria. The release of nutrients from rotovated plants may also be similar for other treatment types. High nutrient levels are not a water quality problem for BCR. There is no basis that toxins are being released from sediments with rotovation. The rotovation program is structured to avoid rotovation during times when fish are spawning or eggs incubating. The program specifically avoids areas of bass spawning. It is unlikely that rotovation is impairing fish migration as no reports generated by the Districts FERC License, by the Agencies or District indicated any affect. The DEA notes a disadvantage of rotovation is that it is labor intensive and that obstacles must be removed. Since the rotovation program on BCR is well established, there are now relatively few submerged obstacles that need to be removed. Similarly, the rotovation field crew is knowledgeable as to the location of underwater utilities and known archeological sites through the use

of reports provided by the District and Corps Archaeologist Mr. Lawr V. Salo respectively. The Rotovator can also operate in areas and times of year of higher flow rates than are possible for chemical use.

12. The cumulative effects analysis notes that if the pilot chemical treatment is cost effective and successful, it may be expanded. How will success be evaluated?

13. Ron Curren, PO County Public Works Director, notes that the County Rotovator crew completes the "loop" of the reservoir in 18 months. The County has pledged in the Aquatic Plant Management Plan to rotovate and root-rip a minimum of 200-300 acres annually. We suggest you confer with the County as 3,000 acres of milfoil seems high.

14. Milfoil, while first observed in Lake Pend Oreille in the last 5 years has been in the Pend Oreille River since the mid 1970's.

We appreciate the opportunity to review the DEA and look forward to working with the Corps and other parties on the continuing implementation of the aquatic plant management plan for BCR. Please contact Pat Buckley at the District (509-447-9334) if you would like to discuss any of the District's comments.

Sincerely,

Mark Cauchy
Director, Regulatory and Environmental Affairs

Response to Comments

General Comment #1:

Funding for the Pilot Project is one year funding. The fund source is thru the Research and Develop Program of the Corps Aquatic Program. Seattle District will try to get follow on funding to do post application monitoring (Fiscal Year 2008) but at this time, no assurances in funding for this can be made. The Corps hopes that the Pilot Project proves to be successful in managing and controlling milfoil and that chemical application becomes another useful tool in invasive plant management. It is not the intent of this pilot project to have a bearing on other aquatic ongoing plant management programs.

General Comment #2:

The Pend Oreille Noxious Weed Control Board (PONWCB) is hosting a public workshop on this project on July 12, 2007 at 6 p.m. The Corps intends to participate in that workshop and is appreciative to the efforts made by PONWCB for the support they have provided on the pilot project.

Specific Comment #1

The Study Plan does not provide details on the analytical approach. No detail on the application of a point intercept monitoring method to evaluate plant density before and after treatment is provided.

The point-intercept method used will be as described in Madsen (1999) as cited in the DEA. This method will provide quantitative measurements of species diversity (per cent occurrence) in 30 points in each evaluation site (herbicide-treated plots and untreated reference plots), pre and 4 weeks post-treatment. In addition to measuring diversity, plant abundance (density) will be collected with a biomass sampler at each point within each plot, pre and 4 weeks post-treatment (Getsinger et al. 1997), as cited in the DEA.

The plan states that four study areas will be treated but there are only three sites identified on the maps.

The DEA states that there will be four, 10-acre evaluation sites, of which only three will be treated with herbicide. Those three herbicide-treated sites are shown on the maps:
1) Cove near Cook Island (3 to 5 acres); 2) backwater area near Camelot Shores (10 acres); and 3) shoreline area downstream of Cusick (3-5 acres). The 4th site has yet to be selected, but will not be treated with herbicide, and will be used as an untreated reference plot. While the maximum herbicide-treated areas would total 30-acres, as indicated in the DEA, we may treat a lesser acreage due to size of plant stands in the designated sites at time of treatment. We intend to determine final plot size (within the parameters described above) during week of 9 July 07.

We assume the fourth site, the control plot, will be identified in the final draft.

Currently, we are considering the use of a portion of Ashenfelter Bay (near Kelley Island, and upstream from the herbicide-treated sites) as our untreated control plot.

The Kelly Island plot appears to be 80 acres rather than 10 acres.
There will be no plot larger than 10 acres treated with herbicide in these trials.

It states that the results will be statistically analyzed but no detail is provided.
Data collected from each plot (aqueous herbicide residues, efficacy assessments, water exchange, etc) will be analyzed using statistically sound procedures that will provide herbicide dissipation characteristics (half-lives, off-target movement), changes in plant species diversity and abundance, and water exchange processes following herbicide application.

Specific Comment #2

What are the evaluation criteria to assess treatment effectiveness?
Quantitative changes in the vegetative community measured at the post-treatment evaluations.

Will follow-up surveys be conducted the following year(s) to evaluate how the treatment affects Eurasian watermilfoil density and plant community composition in subsequent years?
Pending availability of Fiscal Year 08 funds, we intend to quantitatively monitor the vegetative communities at one year post-treatment.

How will flow rate be incorporated into the study?
Simultaneously with the herbicide applications, the fluorescent dye, rhodamine WT (RWT), will be applied to the plots to measure water exchange processes (flow). This inert dye is used by the State of Washington to determine flows in public water bodies.

Where will the monitoring stations be located relative to the study plot?
RWT monitoring stations will be identical to the aqueous herbicide monitoring stations.

The plan mentions that it is anticipated that chemical treatment will favor the establishment of plant communities dominated by native species. How will this be evaluated if no follow up surveys are completed in subsequent growing seasons?
See answer above.

Specific Comment #3

Pre and post-treatment assessments of the vegetative community will be compared during late July - August. The reference plot will be a control for variation intra-seasonal growth.

Specific Comment #4

No containment devices will be used. The scope of the project will not allow for the determination of pretreatment water exchange in the plots. In the more protected back-water plot (i.e. Camelot Shores), a triclopyr rate of 0.75 to 1.5 ppm will most likely be selected. In the plots

more open to the main channel of the river (e.g. Cusick), a rate of 1.75 to 2 ppm will most likely be selected.

Specific Comment #5

Signage as required by the herbicide label and State of Washington regulations will be posted at all herbicide-treated sites every 100 feet along the shoreline and posted buoys along the river side of the plots.

Specific Comment #6

Ms. Sharon Sorby, Pend Oreille Noxious Weed Control Board, is charged with addressing these concerns. The Weed Board will notify the Public Works Director and the aquamog crew captain.

Specific Comment #7

We will consider expanding the Cusick treatment plot (not to exceed 10 acres) to include the public boat launch area when we visit the river on the week of 9 July 07. We are aware of the sensitivity of such a site with respect to public use. Signage will be placed in accordance with the herbicide label and Washington State regulations. In addition, treating early in the week will allow for herbicide degradation/dissipation to occur prior to the weekend, when the likelihood for public use is greater.

Specific Comment #8

Ms. Sharon Sorby is charged with locating all potable water intakes in the vicinity of the herbicide treatments, and will notify all parties to ensure that the treatment plots will be in compliance with water intake restrictions on the label. Herbicide residue monitoring will be conducted at downstream intakes within the 600 to 2,000 foot label restriction, pending application rate used. Locations of these intakes will be added to the DEA maps. By request of the Board of Pend Oreille County Commissioners, Bonner County collected aqueous triclopyr residue samples at the Rotary Boat Launch in Oldtown during the 2006 treatment season. Results varied from no detection to 7 ppb, well within both drinking water and irrigation standards.

Specific Comment #9

Following herbicide treatment, plant death will occur slowly over a period of several weeks. Thus, nutrients released by the decaying plants will be at very low levels over time, rather than as a rapid flush and re-suspension into the water column. As the plants decay, they will collapse to the bottom and disintegrate into small, non-viable tissue fragments. Therefore, plant "waste" is not anticipated to cause aesthetic or other concerns downstream of the treated plots.

Specific Comment #10

The information on cost as it relates to the aquamog that is contained in the Draft Environmental Assessment (DEA) was obtained directly from The Western Aquatic Plant Management Society

website http://www.wapms.org/management/rotovation.html. That was the conclusion that that the Western Aquatic Plant Management Society come to on rotovation. There is no reason to include a cost comparison for the other treatments. There were numerous other disadvantages to rotovation(such as: the lack of selectivity, the potential impacts to fish habitat and associated prey resources, the variability in effectiveness and water quality impacts), to reject this as a possible alternative in this case, in was not just done on the costs.

Specific Comment #11

The author of the DEA researched each of the alternatives in a reasonable and objective way. The information contained in the DEA is from the available literature and the World Wide Web. Information specific to rotovation came from a variety of reports including; "Interim Aquatic Plant Management Plan for the Pend Oreille River" prepared by Pend Oreille County in 2003, specifically Appendixes B& C as well as the web sites previously listed and reports listed in the bibliography. Any detrimental affects attributed to rotovation came from the literature. Because the various treatment alternatives vary widely in the approach (biological, chemical or mechanical) and the sources of information about the alternatives is not standardized, one would not expect information and its presentation to be exactly the same.

In regards to the potential effects to archaeological sites due to rotovation the 1988 report did establish several areas where rotovation could occur without adverse effect to sites that had been submerged by the Box Canyon Dam pool raise. However, no evaluation upstream from the Usk Bridge was undertaken, so it is not possible at this time to determine whether rotovation could occur safely in the unsurveyed area that includes Sites 1 and 2. As backwater probably is minimal in the upper reaches of the unsurveyed zone (Site 1), there may be little or no chance of prehistoric sites occurring within the sediments that would be affected, however.

As to the statement about the history of avoidance, we do not have any specific information on the actual areas that have been rotovated since 1988 and cannot ascertain with what degree of success the avoidance policy recommended in Paragraph 7 of the 1988 report has been followed for the 4 sites in the exclusion list.

Specific Comment #12

Success of the project will be determined by the effectiveness of the treatment, how long it is effective for and the ability of native vegetation to occupy the treated sites.

Specific Comment #13

The text of the document has been changed to include that the County rotovates and root-rips a minimum of 200-300 acres annually.

Specific Comment #14

Commented noted -a change has been made to the text to reflect this comment.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

TAKE PRIDE IN AMERICA

Upper Columbia Fish and Wildlife Office
11103 East Montgomery Drive
Spokane, Washington 99206

June 13, 2007

Jeffrey C. Laufle
Acting Chief, Environmental Resources
Department of the Army
Seattle District, Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Subject: Box Canyon – Pend Oreille River Eurasian Watermilfoil Tryclopyr Treatment Pilot Project; FWS Reference 1-9-07-I-0112, (File #341.0000)

Dear Mr. Laufle:

This responds to your May 10, 2007, letter requesting informal consultation on the Box Canyon – Pend Oreille River Eurasian Watermilfoil Tryclopyr Treatment Pilot project in Pend Oreille County, Washington. We understand that the project involves conducting a pilot study to test the effectiveness of a new formulation of the herbicide triclopyr called Renovate® OTF flake on Eurasian Watermilfoil at three separate 10 acre sites on the Pend Oreille River. Your letter, with a biological evaluation (BE), was received in this office on May 14, 2007, and requested our concurrence with your determinations of effect for bald eagle, bull trout, and designated bull trout critical habitat.

The U.S. Fish and Wildlife Service (Service) concurs that the proposed project, as described in the BE, is "not likely to adversely affect" bald eagles, bull trout, and designated bull trout critical habitat. This decision is based on the fact that no bald eagle nests occur within the proposed project sites, and foraging and roosting habitat will not be affected as there are ample opportunities for bald eagle use along the Pend Oreille River. This decision is also based on the fact that project activities will occur during July and August when water temperatures will be high and water levels will be low, therefore, bull trout are not expected to be in these areas at this time. Triclopyr has a low toxicity to fish and appears to be safe for use in aquatic ecosystems, therefore, designated bull trout critical habitat will also not be adversely affected. Concurrence by the Service is contingent upon implementing the project as described in the BE.

You have requested the Service concur with your determination that the action, as proposed, will have no effect on gray wolf, Canada lynx, or Ute ladies'-tresses. ESA implementing regulations

(50CFR Part 402) do not specifically provide for Service concurrence with an action agency's determination that its proposed action will have no effect on listed species. However, in response to your request and based on the information you have provided to us in the BE, the Service agrees with your determination that the action, as proposed and analyzed, will have no effect on the aforementioned species.

This concludes informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act). This project should be re-analyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Carrie Cordova of this office at 509-893-8022.

Sincerely,

for Supervisor

c: WDFW, Region 1