North Cascades National Park Service Complex

National Park Service
U.S. Department of the Interior

Finding of No Significant Impact

Invasive, Non-native Plant Management Program

May 2012

INTRODUCTION

This Finding of No Significant Impact (FONSI) documents the decision of the National Park Service to adopt a plan to manage invasive, non-native plants in North Cascades National Park Service Complex (hereafter, the Park Complex) and the determination that no significant impacts on the human environment are associated with that decision. Mitigation measures designed to avoid or minimize impacts to park resources and a summary of agency coordination and public comment are also provided.

PURPOSE AND NEED

The Park complex will implement an Integrated Pest Management (IPM) program to control invasive, non-native plants, restore impacted areas, and detect and prevent new infestations. The purposes of this program are to (1) protect natural ecosystem dynamics, including the vegetation, wildlife, and other terrestrial and aquatic resources and processes that are threatened by invasive, non-native plants, and (2) restore conditions in the Stephen Mather Wilderness, which encompasses 94 percent of the Park Complex and is at the core of one of the largest protected areas in the lower 48 states. Natural conditions in wilderness need to be restored where there are current infestations of invasive plants, and protected from degradation in areas that are un-infested. The natural quality of wilderness character will thus improve as restoration actions are taken. Proposed treatment methods and priorities are consistent with those currently being proposed on adjacent lands administered by the US Forest Service, providing an ecosystem-based approach to restoration.

These actions are needed because invasive plants have the capacity to alter the functions and values of the North Cascades ecosystem. For example, invasive plants are displacing native vegetation, resulting in the displacement of the animal populations that rely on the plants for food and shelter. They affect water quality by reducing or depleting water levels or altering runoff patterns and increasing soil erosion. Some invasive plants, like knapweed (*Centaurea* spp.), are allelopathic-they release toxins that

don't allow native plants to grow. Others, such as Scotch broom (*Cytisus scoparius*), are nitrogen-fixing, allowing other non-natives to outcompete native plants that have evolved in nutrient-poor soils. Some invasives, such as cheatgrass (*Bromus tectorum*), alter fire regimes and drastically change landscapes by preventing native vegetation from successfully re-establishing after fire events. Finally, invasive plants degrade wilderness character. For these reasons, invasive, non-native plants are threatening the ecological integrity of our natural areas.

SELECTED ALTERNATIVE

Of the three management alternatives evaluated in the Environmental Assessment (EA), Alternative 2, the Preferred Alternative and the Environmentally Preferred Alternative, will be implemented. The proposed actions under the Preferred Alternative, as detailed in the EA, remain unchanged. No new issues, additional reasonable alternatives, or mitigation measures were suggested during the public review process; therefore none of the comments necessitated changes to the proposed actions.

The selected alternative, also entitled "IPM with Herbicides," includes goals and objectives based on national strategic goals for invasive plant management. These goals are the basis for the Invasive Non-native Plant Management Plan, which will guide invasive plant management within the Park Complex for the next 10 years. Program elements, based on the goals, include:

1. **Prevention and Early Detection.** Actions will include having the park as well as partners and contractors follow Best Management Practices (BMPs); establishing early detection/eradication protocol for new species and/or new populations; specifying invasive plant management responsibilities in permits and contracts; and devoting a portion of funding to education and other forms of prevention.
2. **Inventorying and Monitoring.** Actions will include inventorying the Park Complex for non-native and sensitive plants every five years; monitoring known non-native and sensitive plant populations every year; producing annual reports that summarize management activities for the year; and producing progress reports that analyze program effectiveness and outline appropriate courses of action to meet management objectives if they are not being met every five years.
3. **Prioritization and Control.** Actions will include establishing weed management priorities; eradicating infestations when they are small; stopping the advancing perimeter before controlling the interior of an extensive infestation; attempting to remove seeds from plants that are being contained; and repeating control efforts and monitoring treated areas for effectiveness.

   Priorities. To address the call for establishing weed management priorities, a decision-making tool was created to prioritize the known existing non-native plant species within the Park Complex, currently totaling 225 species. From this list, forty non-native species were deemed invasive and targeted for control. These species and the priority level generated by the decision-making tool are expected to change over time, as new species are discovered or as more is learned about existing species.

Control. Control techniques will include cultural, manual/mechanical, and chemical treatments. Although biological control agents currently exist within the Park Complex, there is no plan to release additional agents at this time. Cultural treatments, such as reseeding or replanting disturbed areas, will be used more often than current levels, often as a preventative method. Manual/mechanical treatments will continue, but there will likely be a reduction in the area currently treated in this fashion because herbicides will be used in place of or in conjunction with historically used manual/mechanical treatments in order to increase treatment efficacy and where target species have not responded to repeated manual/mechanical efforts. Chemical treatments will expand, both in acreage treated and in the number of herbicides available for use. The number of herbicide treatments will increase from current levels because several species that haven't been treated due to either their large extent or unresponsiveness to other control methods will be targeted. Depending on which projects are undertaken each year, the area treated with herbicides will vary, and could range from 600 to 2,000 gross infested acres per year. The upper limit (2,000 acres) is based on the size of the largest project area, which is the Stehekin Cheatgrass project. Twelve herbicides could be used, however, additional herbicide formulations could be used if a risk assessment is conducted for the active ingredient, and the use of the herbicide is consistent with actions and impacts reviewed in the EA.

Projects. In addition to the priority species list, which prioritizes species based on their park-wide status, a project list was formulated by applying the decision-making tool criteria to distinct populations of these species. Resource managers considered the density and distribution of a particular invasive species population, the risk and impacts posed by each population to park resources, and the feasibility of control or eradication in developing the project list. This process helped to refine projects and focus management efforts where they are most needed. Using data that is current as of 2009, there are 25 invasive plant projects of various sizes, 12 of which will be implemented in the Stehekin Valley, and 13 of which will be implemented in the Skagit Valley. Seven projects will take place within designated wilderness. These projects, and others similar in scope, will continue each year until maintenance control levels can be reached. It is expected that most new projects will require two to three years of initial control work in order to establish maintenance control levels (a better than 90% reduction) of invasive species, with significantly fewer follow-up treatments to control remaining individual plants that sprout from the seed bank, from root fragments, or from previously undetected infestations. The amount of herbicides and mechanical work that will be needed for subsequent treatments will be significantly reduced after the initial control work is completed.

Although this listing contains current information on infestations, managers realize that over time new species will move in and infestations will change. Control of new species and new infestations may take priority over other treatments. Methods used to control new species or new infestations will be based on the ecology of the species and the most current research on effective control methods.

4. **Restoration.** Actions include developing a revegetation/restoration plan for every infestation that includes surveying site and determining what native plants will be used; collecting seeds and/or propagating native plants; and implementing restoration of disturbed areas following invasive plant removal.
5. **Outreach, Education, and Cooperation.** Actions include educating NPS employees, contractors, partners, concessioners, and the public about how to identify and prevent spreading weeds; encouraging these people to inform NPS about observed invasive plant locations; posting prevention practices at strategic locations; collaborating with invasive plant management experts; promoting research within the Park Complex; communicating the results of the latest research on invasive plants; encouraging public support through volunteer invasive plant management projects and activities; providing information sheets for horseback riders and packers, including where to obtain weed-free hay or other forage; enhancing existing management partnerships with groups such as the Skagit Cooperative Weed Management Area Working Group, neighboring US Forest Service Ranger Districts, and concerned citizens; cooperating with partners whose actions have the potential to exacerbate invasive plant infestations, especially Seattle City Light and Washington State Department of Transportation (WSDOT); working together with these entities on improving prevention efforts, adhering to BMPs, and clarifying roles and responsibilities for invasive plant management; considering establishing cooperative agreements with other landholders and land management agencies under the Consolidated Natural Resource Act of 2008[1] to conduct invasive plant management activities on lands within or adjacent to the Park Complex.

In addition to the five program elements that are linked to national strategic goals for invasive plant management described above, the following additional elements will be implemented.

Minimum Requirements Analysis. As part of the EA process, a programmatic level Minimum Requirements Analysis (MRA) was completed for invasive plant management actions proposed within designated wilderness. Based on the MRA, the NPS concluded that treatment of invasive plants within wilderness is a necessary action, and therefore meets the minimum requirement for administration of the area as wilderness. Step 2 of the MRA involves an analysis of potential "tools" to accomplish invasive plant management within wilderness. A combination of *Option D: Mechanical/herbicide treatments using human/stock transport and motorized equipment* and *Option E: Mechanical/herbicide treatments using helicopter transport and motorized equipment* are incorporated in the Selected Alternative. These options were chosen as the minimum tool because they best protect and restore the natural quality of wilderness character while minimizing impacts to the other three qualities. If not treated, invasive plants

[1] According to this act (Pub. L 110-229, Title III, Section 301), the NPS may enter into cooperative agreements with State, local, or tribal governments, other Federal agencies, other public entities, educational institutions, private nonprofit organizations, or participating private landowners for the purpose of protecting natural resources of units of the National Park System through collaborative efforts on land inside and outside of National Park System units. A cooperative agreement shall provide clear and direct benefits to park natural resources and provide for preventing, controlling, or eradicating invasive exotic species that are within a unit of the National Park System or adjacent to a unit of the National Park System.

could permanently impact ecosystem components and processes. This risk was compared with the impacts of treatment on the other qualities, and the NPS determined that the long-term benefits of restoring ecosystem processes outweigh the short-term adverse impacts to the qualities of untrammeled, undeveloped, and opportunities for solitude or primitive and unconfined recreation.

Project Planning, Implementation, and Tracking. The Park Complex will implement several measures that will assist with annual project planning. First, the park botanist will hold an annual vegetation management meeting with park personnel, including the Exotic Plant Management Team (EPMT), who either work directly with native and/or non-native vegetation, or whose job duties may involve activities that have the potential to spread invasive plants. During each meeting, the past year's accomplishments will be reviewed and a work plan will be developed for the coming year based on priorities for control. Project proposals will be developed for submittal to the EPMT, and a list of remaining smaller projects to be completed by park personnel will be prioritized and assigned to appropriate staff members. Actions taken (or not taken) to prevent invasive plant infestations will be reviewed and the group will work to improve prevention efforts.

Second, prior to any project approval, the lists of EPMT and smaller park projects to be completed that year will be presented to the park Inter-Disciplinary Team (IDT) in order to evaluate if proposed projects are covered under the EA, whether more environmental compliance is needed, including additional wilderness minimum tool considerations, and to coordinate treatment projects among staff members. Projects confirmed by the committee to proceed will be subject to one final step if they involve herbicide application: regional or national IPM Coordinator approval. Each year the park IPM Coordinator will submit Pesticide Use Proposals (PUPs) to the Regional IPM Coordinator, who must approve all herbicide use within parks. Projects involving a single herbicide application in excess of 400 acres need approval by the National IPM Coordinator.

Finally, all invasive plant control and restoration projects, whether completed by the EPMT or park personnel, will be documented by the park botanist on an annual or more frequent basis. This documentation will aid in annual monitoring efforts to determine if current methods are effective.

Other Alternatives Considered

Two other alternatives were considered and evaluated in the EA. These alternatives are described briefly below.

Alternative 1: No Action

Alternative 1 continues with current management. Invasive, non-native plant management would continue into the future as it has over the last five years. The Park Complex would not implement a more comprehensive invasive plant management program. There are 24 invasive plant species that would be considered priority for treatment. Six projects would be implemented on the East Side in the lower Stehekin Valley within Lake Chelan National Recreation Area, two of which would be limited to inventory only with no treatments occurring; and nine projects would be implemented on the West Side within portions of North Cascades National Park and Ross Lake National Recreation Area, one of which would be limited to inventory only with no treatment occurring. Control techniques would concentrate

primarily on mechanical methods of controlling and containing existing populations of invasive non-native plants plus limited herbicide use. Many species that are currently not being treated would continue to go untreated and spread.

Alternative 3: IPM without Herbicides

Alternative 3 is similar to Alternative 2, except that herbicide use would be discontinued. This alternative was developed in response to public comments that expressed concern about the use of herbicides. The priority species list developed in Alternative 2 would be used; however, several species (12) would not be controlled because the available methods would be ineffective at reaching the objectives. As a result, eight projects described in Alternative 2 would not occur under this alternative. Control efforts would include mechanical, cultural, and biological methods, with the goal of eradicating invasive weeds when it is a feasible option.

Alternatives Considered and Dismissed

Two alternatives that considered the use of only one treatment methodology were considered but rejected. Similarly, integrated management plans that did not use chemical or biological control options were also considered but rejected. The use of domestic ruminants, such as goats, to control invasive plants was also considered but rejected. These alternatives are described below.

Use Only Mechanical Control Methods

Mechanical treatment alone will not control all invasive weeds. It is a viable option for scattered individual plants or in areas where other control techniques are not recommended. However, it can cause soil disturbance and is labor/time intensive. Because of the difficulty of removing rootstocks from compact or rocky soil, it can be ineffective. In some cases, mechanical control can make the infestation worse. For example, pulling invasive weeds that have rhizomatous roots (such as rush skeletonweed or Japanese knotweed) actually induces the plant to send up shoots from root fragments that are left in the ground, creating many small plants from what used to be a single plant. Also, some plants that can usually be controlled by pulling, such as knapweed, are so widespread and have huge seed banks that a combination of pulling and chemical treatment is preferred.

Using mechanical methods alone can:

- create major ground disturbance, allowing weed seeds to germinate;
- leave root fragments in the ground to resprout;
- take excessive amounts of time to control, for example, regular revisits to the infested site;
- result in trampling of native vegetation during repeat control efforts; and
- cost more and be less effective than a combined treatment approach.

For these reasons, this alternative was considered but rejected.

Use Only Chemical Control Methods

The use of chemical control alone was considered but rejected because in some situations, invasive plants can be controlled without the use of herbicides. For example, the spread of weeds that are annual or biennial species (such as some knapweed species, mullein, and herb Robert) that do not occur

in large densities can usually be controlled by pulling. Because reproduction of these species relies primarily on the ability of the plant to produce seed, physical removal can often be an effective control method if the entire root is removed. However, with perennial species, which may reproduce by fragmentation of roots or shoots as well as seeds, systemic herbicides are necessary to ensure mortality of the entire plant. Additionally, mechanical and chemical control are often used in combination, for example, roadside mowing followed by selective herbicide application, or cut-stump treatments performed on woody species.

Weed Management without Biological Control

Developing an IPM Program that considers all treatments except biological control was considered, but was eliminated because of the efficiency and efficacy of some biological control agents for treating some invasive plants. In some instances, biological control may be the only feasible method available for reducing the threat of invasive plants to environmental and cultural resources.

Use Domestic Ruminants to Control Weeds

The use of domestic ruminants as a mechanical means of weed control (grazing) was an issue that was considered as a management tool, but not further addressed. Ruminants, such as goats, are non-selective grazers. The use of ruminants as a management tool within the Park Complex would not be feasible for the following reasons: 1) because of the potential for removing native plants; 2) the need to fence the animals in order to contain them would be very difficult given the rough terrain throughout the Park Complex and the ground disturbance caused by the animals could compound the invasive plant issue; and 3) because few of the invasive plant populations within the Park Complex are large enough to make this effort cost effective.

Environmentally Preferred Alternative

Alternative 2, IPM with Herbicides, is the Environmentally Preferred Alternative. The biological and physical environment is best protected by implementing an Integrated Pest Management program that controls invasive, non-native plants that threaten native ecosystems. Control of invasive plant populations allows impacted ecosystem processes and functions to recover by facilitating restoration of areas damaged by invasive plant species, while protecting healthy ecosystems that have not been impacted. Alternative 2 meets environmental policy goals by expanding and improving upon the Park Complex's current invasive, non-native plant management efforts through implementation of an adaptive management strategy that will assist with prioritization of invasive plant management projects, and allow a wider range of control options. This will include expanding the use of herbicides for the control of extensive populations of perennial rhizomatous species, for species and populations that managers have been unable to control through previous mechanical and cultural efforts, and for those species that are currently too widespread to manage effectively by other means. Alternative 2 will allow a greater range of control methods to be considered, and further incorporate restoration into the complex's long-range invasive plant management program. The potential short-term impacts resulting from an increase in herbicide use and expanded control of invasive plant species populations are outweighed by the long-term benefits of removing invasive plant species from the Park Complex.

Alternative 1, the No Action Alternative, would attempt to meet environmental policy goals by continuing the Park Complex's existing invasive, non-native plant management program. It is not the Environmentally Preferred Alternative because control efforts would be limited to current projects, and no additional techniques, herbicides, or biological controls would be introduced. Projects would remain limited in scope and new projects would need to be vetted on a case by case basis through the park's compliance process.

Alternative 3, Integrated Pest Management without Herbicides, would attempt to meet environmental policy goals by instituting an adaptive management strategy similar to that of Alternative 2, however, herbicides would not be used to achieve management goals. It is not the Environmentally Preferred Alternative because the Park Complex would be unable to effectively treat some invasive, non-native plant species currently being managed under the existing management program. The inability to treat a number of priority invasive plant species would result in loss of habitat that would directly impact populations of native flora and fauna as invasive species continue to spread and out-compete native plant species. Additionally, the spread of some invasive species could result in immediate danger to local communities and park infrastructure. For example, not treating cheatgrass in the Stehekin Valley could cause a substantial increase in fine fuels, resulting in more frequent and easily ignited fires.

Best Management Practices and Mitigation Measures

The following best management practices (BMPs) were developed to minimize impacts of activities that could create or exacerbate invasive plant problems. BMPs are also used by park personnel during the treatment of invasive plant populations to minimize the environmental impacts of the treatment method. The BMPs listed below help to address three primary administrative activities that occur within the Park Complex: 1) Maintenance and construction; 2) Wilderness activities; and 3) Fire management. Mitigation measures designed to protect resources, including those that specifically refer to herbicide use and application, are listed in Table 1.

Maintenance and Construction

Potential pathways for invasion through the movement of gravel and fill include the following: importing material from foreign sources, equipment (backhoes, bull dozers, mowers, etc.), stockpiled local materials, side casting, imported sand and gravel used along SR 20 by WSDOT, construction activities, and emergency reconstruction (e.g., floods and other stochastic events). Organized by practices that should be followed during the planning phase of project development and those that should be followed during implementation or day to day operations, the BMPs include:

1. Planning (*Responsibility: Project leader in coordination with Park Botanist, unless otherwise noted)*
    a. As maintenance staff and other divisional staff annually propose new projects in PMIS, project leads will work with resource management staff to ensure invasive species management costs are included in the proposal.
    b. Incorporate weed prevention and control in plans for projects that will include ground or vegetation-disturbing activities.
    c. Identify project-specific risks of invasive plant introduction and spread and project-specific prevention practices. Identify needs and treatments at the onset of project planning.

d. Prior to the project, conduct invasive plant surveys within the project site, and access routes during the planning process. Develop treatment plans for existing invasive plant populations. Responsibility: *Park Botanist*.
e. Identify staging areas that are free of invasive plants during the project planning stages.
f. A staging area standard operating procedure will be developed for each staging area in the park to identify how and where materials stored or taken from a staging area can be used throughout the park.

2. Operations (*Responsibility: Project leader, unless otherwise noted)*
   a. Minimize/eliminate ground disturbance.
   b. Utilize fresh shot rock when available and applicable.
   c. Avoid stockpiling or bin/contain/treat stock piles and cover between uses.
   d. Require contractors to cover loads when traveling through the park.
   e. Before any equipment is brought into the park, it will be pressure or steam washed to remove seed-containing soil.
   f. Contracts for park projects will include language to ensure that all equipment will be inspected and cleaned prior to working in the park.
   g. Staff will wash equipment that has been off-road or working in an infested site at the Marblemount wash rack facility or with a power washer in Stehekin before moving it from place to place within the park.
   h. Construction and restoration materials will be free of invasive weed seeds or other propagative plant parts. Such materials include boulders, soil, sand, gravel, rock, road base, straw, and silt and erosion control materials. Eliminating invasive plant seeds may raise the cost of some projects, but will prevent much more costly and prolonged invasive plant control efforts in the future.
   i. Vegetation management staff will inspect proposed quarries or source sites for presence of invasive plants annually and provide evaluations and recommendations for sources to maintenance staff, park contracting officers, and contractors. *Responsibility: Park Botanist*.
   j. In cases of emergency reconstruction (e.g., floods and other stochastic events) materials will be acquired from pre-approved (by Vegetation Management staff) vendors and pits.
   k. After completing construction, bare areas will be revegetated or bare soil will be covered with local litter and duff mulch as soon as possible. Mulch will provide a source of seeds to reestablish native vegetation and reduce the risk of non-native seeds germinating. Ideally, the litter and duff should be collected from the construction zone prior to disturbance. Otherwise collect from surrounding areas but do not denude the collection area. Leave at least 50 percent of the material in place and don't disturb vegetation. *Responsibility: Park Botanist.*
   l. Vegetation Management staff will work with the WSDOT and Seattle City Light to encourage the use of clean sand and gravel imported along the highway and along the powerline corridor. *Responsibility: Park Botanist.*
   m. Commercial users that disturb established vegetation will be required to provide bonds that are retained until sites are returned to a specified condition.
   n. Vegetation Management Staff will monitor and treat disturbed sites post project. *Responsibility: Park Botanist.*

Wilderness Activities

Potential pathways for spreading weeds into wilderness through park operations include: administrative centers/staging areas (Marblemount, Stehekin), pack stock operations, native plant nursery operations, helicopter operations, administrative camps, Seattle City Light Properties/historic plantings, and

Trailheads/access points. The following measures will be used to prevent the spread of weeds into wilderness:

1. Administrative centers/staging areas
    a. Develop concrete pads and covered storage for staging areas for both Marblemount and Stehekin. *Responsibility: Maintenance supervisors*.
    b. Consolidate and remove excess materials stored in the Marblemount bone yard to reduce the footprint of the storage area. *Responsibility: Maintenance supervisors*.
    c. Develop a boot cleaning station and informational exhibit at the leading edge of the cheatgrass invasion in the Stehekin area. *Responsibility: Stehekin District Natural Resource Manager*.
    d. Provide boot cleaning equipment for trail crew, wilderness rangers and resource staff to be used prior to entering the backcountry for field visits. *Responsibility: Park Botanist*.
2. Pack stock operations
    a. A pasture rehabilitation plan will be developed and implemented that outlines how existing invasives will be removed, how treated areas will be restored, and how future invasive plant infestations will be minimized through prevention, monitoring, and rapid response. This will create pasture with fewer aggressive weed species which are transported into the wilderness via stock, and reduce the need for imported hay. *Responsibility: Park Botanist in coordination with Park Packer*.
    b. Continue early detection surveys in Marblemount pasture initiated by the EPMT program. *Responsibility: Park Botanist*.
    c. A monitoring plan will be developed for early detection of invasive plants in areas frequented by pack stock that would occur in conjunction with trail surveys. *Responsibility: Park Botanist.*
    d. Encourage the use of weed-free feed 24 hours prior to entering the park with stock. *Responsibility: Visitor Contact Station Staff*.
    e. Require the use of weed-free feed for all stock use within the park (day use and overnight stays) *Responsibility: Law Enforcement*.
    f. Include weed-free feed requirement language in commercial use permits. *Responsibility: Contracting Staff.*
    g. Brush horses and pack animals thoroughly and have their hooves cleaned before entering the Park Complex. *Responsibility: Park Packer*.
    h. Train park packers in identification of common weeds and ensure sightings are communicated to Vegetation Management staff. Responsibility: *Park Botanist in coordination with Park Packer*.
    i. Provide technical assistance to stock owners in finding weed-free feed sources, and in weed-free pasture management and certification in Stehekin. *Responsibility: Stehekin District Natural Resource Manager.*
3. Nursery operations (*Responsibility: Park Botanist*)
    a. Use bare root plants when feasible to reduce amount of potting soil, which may contain weeds or weed seeds, being transported into the field.
    b. Evaluate feasibility of implementing a spray regime in the nursery to reduce the possibility of contamination from the areas surrounding the greenhouse.
    c. Consider replacing gravel pads with concrete or wooden walkways to discourage weed germination.
    d. Continue using soil-less propagation mixes.
4. Helicopter operations (*Responsibility: Helicopter Managers*)
    a. Follow protocols outlined in fire section, e.g. nets, buckets, lines will be inspected and cleaned to prevent inadvertent seed spread.

Fire Suppression Activities *(Responsibility: Resource Advisors in Coordination with Park Botanist)*
Potential pathways for spreading weeds through fire operations include exposed soils (hand line, high fire severity, etc.), firefighters, including interagency crews (e.g., smokejumpers, helitack, Fire Modules), vehicles, hose, tools (including chainsaws), helicopters – nets and buckets, staging areas, helipads, and retardant. BMPs for fire suppression activities include:

1. Bare soil that results from hand lines will be rehabbed by pulling duff, litter, and cut material back over lines as soon as possible following suppression. Mulch will provide a source of seeds to reestablish native vegetation and reduce the risk of non-native seeds germinating.
2. Firefighters, including interagency crews (e.g., smokejumpers, helitack, Fire Modules) can transport weed propagules from site to site and fire to fire. Resource advisors will contact crews to review BMPs with NPS and interagency crews.
3. Use gators/duct tape over shoe laces and boots for crews that hike between parks and infestations (e.g., fire effects crews) unless prohibited by helitack requirements. Clean boots, pants, packs and other personal equipment of seeds and soil when moving between infested sites or other parks.
4. Before any equipment is brought into the park, it will be pressure or steam washed to remove seed-containing soil. Equipment that has traveled off-road, such as backhoes, tractors, loaders, excavators, dozers, bobcats, wheeled compressors, or trucks and trailers may be contaminated. This restriction will not apply to equipment responding to initial attack of wildland fire where fire spread is threatening life or property. Staff is encouraged to wash equipment that has been off-road before moving it from place to place within the park, particularly when moving from lower to higher elevations.
5. Fire hoses that have been determined to have the potential to introduce terrestrial or aquatic pests are shipped to NIFC to be cleaned. Fire staff will document where hoses have been used and they will not be transported from contaminated sites to uncontaminated sites.
6. Fire tools and hand equipment will be inspected and cleaned accordingly.
7. Helicopter nets will be inspected for weed seeds. They will be bundled and stored in a weed free environment. Nets will be spread on clean tarps prior to loading to prevent contamination from the helipad. Consider the construction or use of existing concrete or asphalt pads so nets can be inspected, loaded and bundled up for storage and in a weed-free state.
8. Helicopter buckets should be inspected and washed accordingly. Inquiries should be made as to where the buckets have been used previously and park staff should be made aware of potential sources of aquatic invasive species. The park will provide clean buckets and supporting equipment for contractors and outside agencies involved in suppression activities.
9. Staging areas will be maintained in a weed free state.
10. Retardant is used with superintendent approval only. These areas should be mapped as a part of daily operations and surveyed in the following years for the potential introduction and spread of exotic plant species.
11. For all fire activity (wildland and prescribed fire), maps of all fire staging areas, observation points, sling load sites, and hand line will be provided to resource staff for prioritization and long term monitoring.

Prescribed Fire Activities *(Responsibility: Park Botanist in Coordination with Fire Management Officer)*
Several cheat grass infestations have been found within proposed prescribed burn unit boundaries. If not treated, or mitigated, these infestations will spread after burning. BMPs include:

1. Infestations will be surveyed and mapped prior to burning.
2. If spraying herbicides, infestations should be treated prior to burning.

3. Alter burn prescription so that high fire severity is minimized in infested areas.
4. Consider seeding the infested area with native species post-fire to outcompete cheatgrass and other non-natives.

Mitigation measures designed to protect resources are listed below in Table 1. Accomplishment of each measure is the responsibility of either the Park Botanist or the Exotic Plant Management Specialist, depending on which person is overseeing the project work.

TABLE 1: MITIGATION MEASURES DESIGNED TO PROTECT RESOURCES

Resource	Mitigation Measure
Soils	• Herbicides with longer persistence (i.e., Clopyralid, Imazapyr, Imazapic, Chlorsulfuron, metsulfuron methyl) will be applied with less frequency to limit the potential for accumulation of herbicides in soils
Hydrology & Water Quality	• Highly water-soluble herbicides will not be used in areas where there is potential to affect surface water or ground water resources • Only herbicides that are registered for use in or near water will be used in those areas • Only those herbicides that have a low potential toxicity, such as glyphosate (Roundup Pro and Rodeo), imazapyr (Habitat, Arsenal), and triclopyr amine formulations will be used within areas near surface waters or in areas with a high leaching potential • Applications of herbicides will be avoided during periods and in areas where seasonal precipitation or excess irrigation water is likely to wash residual herbicides into waterways • When recommended from the Regional IPM Coordinator, vertical buffer zones to ground water will be used
Wetlands	• Treatments in seasonally flooded wetlands and riparian areas will be scheduled during the dry or low water phase of the year, or during reservoir draw down • Appropriately labeled herbicide formulations will be used in wetlands and within 10 feet of standing and moving water
Vegetation	• Project areas will be surveyed for sensitive native plant species prior to project implementation • Herbicides will be selected to maximize the effectiveness of the treatment on the target invasive plant and to minimize the potential effects on non-target plants • Herbicides will be applied at the appropriate time based on the herbicide's mode of action, and plant growth stage. Poor timing of application can reduce the effectiveness of herbicides and can increase the impact on non-target plants
Fish & Wildlife	• *Spotted owls:* limit disruptive activities within 35 yards of historical nest sites during the early nesting season (March 1 to July 15) • *Bull trout:* limit streamside and emergent invasive plant herbicide applications when the least number of life stages are present (July to early August) • Herbicide application buffer zones adjacent to salmon-supporting waters will be followed for certain herbicides pursuant to the 2004 U.S. District Court for the Western District of Washington injunction (Washington Toxics Coalition, et al. v. EPA). Of the NPS proposed herbicides, 2, 4-D and triclopyr BEE are currently the only ones requiring buffer zones. The current buffer distance is 20 yards for ground applications or any applications of a granular formulation, with the following exceptions: herbicides registered for aquatic use do not require any buffer if the application is overseen by a certified applicator, precipitation is not occurring or forecast to occur within 24 hours, and only the amine formulations are used. Herbicides not registered for aquatic use require a 15-foot buffer under the same conditions stated above, plus one additional condition: winds are not greater than 5

Resource	Mitigation Measure
	mph. The EPA pesticide list is subject to change so it should be consulted prior to project implementation at *http://www.epa.gov/espp/litstatus/wtc/maps.htm*. • Personnel will time surveys and treatments to avoid spawning, and/or be trained to identify spawning areas in order to avoid them • Application of herbicides where treated vegetation may overhang surface waters or be present as aquatic emergent vegetation will take into account the spawning and reproductive cycles of sensitive fish species • Only those herbicides that have a low potential toxicity, such as glyphosate (Roundup Pro and Rodeo), imazapyr (Habitat, Arsenal), and aminopyralid (Milestone) will be used within areas near surface waters or in areas with a high leaching potential • Invasive plant control work that will involve the use of heavy equipment, such as the Lake Chelan reed canarygrass project, will require surveys in order to determine if amphibians are present; heavy equipment use will be minimized if amphibians are found to be present
Natural Soundscapes	• The minimum tool concept will be used to accomplish project work when noisy equipment is being used (i.e., the quietest equipment will be used to accomplish goals and objectives of the project)
Cultural Resources	Where non-native species are features of park developments or National Register eligible cultural landscapes, NPS staff assess the ecological risk of these species (for example, the ability to spread into adjacent landscapes) and the cost of maintaining the cultural landscape and preventing their spread outside this boundary a. Non-native plants that pose no significant threat or nuisance in surrounding natural areas are exempt from control efforts within the boundaries of developments and cultural landscapes b. Non-native (invasive) plants that pose a threat or are a nuisance will be managed as appropriate, taking cultural and historic resource needs into account, to prevent further natural resource management problems, and Resource Management staff will work with the local and regional historic landscape specialist to replace non-native invasive species with native species that maintain the appearance of the historic landscape
Wilderness	• New projects in wilderness, or existing projects for which change in scope may be necessary, will first undergo a project-specific minimum requirements analysis with opportunity for public review as appropriate • Motorized equipment and helicopter use in wilderness will be limited to the shoulder seasons and during the week in order to minimize impacts to solitude and the undeveloped quality of wilderness character
Visitor Use & Experience	• Project work would occur during the shoulder seasons and/or during the week in order to minimize impacts to visitors
Human Health & Safety	• Blackberry herbicide treatments will occur when plants are not in fruit in order to avoid consumption of treated berries • The Park Complex currently monitors potable drinking water quality. This monitoring will continue to confirm that potable water meets drinking water standards as outlined by the Safe Drinking Water Act (SDWA) • Herbicide applicators will obtain any certifications or licenses required by the state and/or county, or they will be under the immediate supervision of a licensed applicator • Job hazard analyses will be developed to identify potential hazards of particular activities. Each analysis will define the activity, identify the hazards associated with each phase of the activity, and identify ways in which to minimize or eliminate hazardous conditions that could result in injury • Equipment used for invasive plant management will considered a standard device

Resource	Mitigation Measure
	with established safety protocols for its use; training on the proper use of equipment, including herbicide application, will occur every year with invasive plant management employees • Safety protocols for storing, mixing, transporting, application, handling spills, and disposing of unused herbicides and containers will be followed at all times • Areas treated with herbicides will be marked during the no-entry period to advise visitors against entering treated areas. Visitor information center employees will also inform visitors of treatments taking place in areas included in their itinerary
General Herbicide Mitigation Measures	• Work crews use herbicides to control specific invasive plant populations when management objectives cannot be met with the use of the other (manual/mechanical, cultural, biological) control techniques • Herbicides will be selected and BMPs will be implemented to maximize the effectiveness of the treatment on the target invasive plant, and to minimize potential adverse effects on non-target plants • All product labels will be read and followed by herbicide applicators. It is a violation of federal law to use an herbicide in a manner that is inconsistent with its label. All federal, state, and local regulations regarding herbicide use will be followed at all times • Herbicides will be applied according to application rates specified on the product label. Reduced application rates will be used wherever possible. • Herbicides will be applied as near to the target plant as possible • Herbicide application will account for meteorological factors such as wind speed, wind direction, inversions, humidity, and precipitation in relation to the presence of sensitive resources near the treatment area and direction provided on labels. Herbicides will only be applied when meteorological conditions at the treatment site allow for complete and even coverage and would prevent drift or volatilization of spray onto non-target sensitive resources or areas used by humans. Herbicides would not be applied during periods of dead calm (as this may indicate an inversion) or when wind velocity and direction pose a risk of spray drift • Equipment will be maintained and calibrated prior to each application of herbicide. Herbicides will be applied using coarse sprays to minimize the potential for drift. Avoid combinations of pressure and nozzle type that would result in fine particles (mist). Add thickeners if the product label permits • As needed to protect the efficacy of the herbicide, water will be buffered, depending on hardness, pH, and other factors • Herbicides will be applied at the appropriate time based on the herbicide's mode of action. Poor timing of application can reduce herbicide effectiveness and can increase the impact on non-target plants • Herbicides with high volatility will not be used near sensitive areas because of the potential for unwanted movement of herbicides to these areas • Herbicides with longer persistence will be applied at lower concentrations and with less frequency to limit the potential for accumulation of herbicides in soils • NPS policy requires that only herbicides that are expected to be used in a 1-year period can be purchased at one time. Therefore, herbicides will not be stored for periods greater than one year. Herbicide efficacy is lost over time. This practice of purchasing no more than a one-year supply will maintain herbicide efficacy that would otherwise be reduced by longer storage

All BMPs and mitigation measures detailed above will utilize "minimum tools" as previously described under the selected alternative.

WHY THE SELECTED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN ENVIRONMENT

Using the 10 significance criteria as defined in the Council on Environmental Quality's NEPA regulations (Section 1508.27), the NPS has determined that the selected alternative will have no significant adverse effect on the human environment. The selected alternative can be implemented with no significant adverse impacts on soils, hydrology or water quality, wetlands, vegetation, fish or wildlife, natural soundscapes, cultural resources, wilderness, visitor use and experience, human health or safety, socioeconomics, or park and partner operations. The following criteria were used to determine the significance of each impact:

1. **Impacts that may have both beneficial and adverse aspects and which on balance may be beneficial, but that may still have significant adverse impacts that require analysis in an EIS.**

No major adverse impacts were identified that would require analysis in an EIS. The selected management alternative will have adverse impacts that range from negligible to moderate. Impacts to hydrology, water quality, wetlands, vegetation, natural soundscapes, cultural resources, visitor use and experience, and human health and safety will be minor. Impacts to soils will range from minor to moderate. Impacts to fish and wildlife and wilderness character will range from negligible to moderate. For the majority of impact topics, there will be long-term beneficial impacts.

2. **Effects on public health and safety.**

The selected alternative will have short-term minor adverse impacts to public health and safety by increasing the chance of exposure to dangerous situations (especially workers), such as herbicide exposure and working in rough terrain or along roadways with traffic. However, the vast majority of visitors and park staff will not be affected.

3. **Unique characteristics of the area (proximity to historic or cultural resources, wild and scenic rivers, ecologically critical areas, wetlands or floodplains, and so forth).**

Several projects will take place within the Stephen Mather Wilderness; however, invasive plant management work was deemed the minimum requirement for administration of the area as wilderness because it best protects and restores the natural quality of wilderness character while minimizing impacts to the other three qualities. Several projects will also take place adjacent to creeks and rivers that are designated or eligible for inclusion in the Wild and Scenic River System; however, the selected alternative will not adversely affect the values that render any creek or river suitable for designation, nor preclude future eligibility. Project work that will occur in or near wetlands will have short-term, minor adverse impacts, but long-term beneficial impacts as natural wetland functions are restored and/or protected.

4. **Degree to which impacts are likely to be highly controversial.**

There were no highly controversial impacts identified during preparation or public review of the EA. While some members of the public may not support the use of herbicide, the results of the public involvement process do not indicate the plan is controversial. To the contrary, there appears to be broad support for this plan.

5. **Degree to which impacts are highly uncertain or involve unique or unknown risks.**

There were no highly uncertain, unique, or unknown risks identified during preparation or public review of the EA. Although Seattle City Light expressed concern over herbicide toxicity, the NPS has reviewed the risks to human health and the environment and is committed to implementing Best Management Practices and mitigation measures to minimize these risks.

6. **Whether the action may establish a precedent for future actions with significant effects, or represents a decision in principle about a future consideration.**

The selected alternative neither establishes a precedent for future actions with significant effects, nor represents a decision in principle about a future consideration.

7. **Whether the action is related to other actions that may have individual insignificant impacts but cumulatively significant effects.**

The impacts of the selected alternative on each impact topic were identified in the EA. Cumulative impacts to each resource were also identified and none will have cumulatively significant effects.

8. **Degree to which the action may adversely affect historic properties in or eligible for listing in the National Register of Historic Places, or other significant scientific, archeological, or cultural resources.**

There will be no adverse impacts to cultural resources, including historic properties in or eligible for listing in the National Register.

9. **Degree to which an action may adversely affect an endangered or threatened species or its habitat.**

The NPS determined that the selected alternative will have no effect on the marbled murrelet and Canada lynx, and that it may affect, but is not likely to adversely affect, the gray wolf, grizzly bear, northern spotted owl, bull trout, Chinook salmon, and steelhead. The US Fish and Wildlife Service and National Marine Fisheries Service concurred with the NPS' determinations. Mitigation measures described previously will help to minimize potential impacts to any of these species.

10. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

The selected alternative does not violate any federal, state, or local law, or requirements imposed for protection of the environment.

PUBLIC INVOLVEMENT

SCOPING

The public scoping process was initiated on two separate occasions through letters and media releases issued by the NPS in writing and electronically. The first phase of public scoping began on April 10, 2002; a letter was issued from the park superintendent to interested parties seeking input regarding invasive non-native plant management. The letter provided information about the threat of invasive plants in the Park Complex and a brief synopsis of the proposed actions. The Lake Chelan Mirror published an article announcing the scoping period and describing the proposed plan. The deadline for public comment was May 15, 2002. Approximately two hundred sixty-one letters inviting public participation were sent to private individuals who had indicated an interest in invasive plant management as well as agencies, tribes, and organizations. Shortly after the public scoping process ended and preliminary development of the EA took place, severe flooding and fire events occurred that directed NPS personnel away from completion of the document and final public review. In 2007 and 2008 NPS personnel were able to revisit the document, reinitiate public scoping, and work toward completion of the document. On December 18, 2007, a letter from the Park Superintendent and media release invited further public comment until January 30, 2008. The Wenatchee World published an article announcing the scoping period and describing some of the invasive plant management issues within the Park Complex.

A total of 16 comments were received via mail, email and phone during the two scoping periods; four from 2002 and 12 from 2007-08. Many of the comments were multifaceted and feedback was received from unaffiliated individuals as well as groups or agencies such as the Noxious Weed Control Board of Whatcom County, Seattle City Light, Washington Native Plant Society, and National Parks Conservation Association. In 2002, responses included general support of an IPM program and invasive plant control activities and concern over some specific invasive species and the need for their control. In 2008, responses included both support for the use of an IPM program that uses herbicides, as well as concern over the impacts of using herbicides on the environment. These comments were thoroughly reviewed and analyzed to identify substantive concerns, and then they were considered during the development of the alternatives for the EA.

PUBLIC COMMENT ON THE EA

The EA was released to the public on November 14, 2011, and comments were accepted through January 11, 2012. Two hundred sixty-three letters were sent to interested individuals, agencies, tribes, and organizations, informing them of the availability of the document on-line (via the NPS PEPC website) as well as at local visitor information centers. No copies of the EA were sent to any individuals or

organizations. The park also issued a media release announcing the document's availability and the schedule for upcoming public meetings. The release was sent to 213 organizations on the park's media distribution list, including media outlets, chambers of commerce, elected officials, agencies, and partners. During the public comment period two public meetings were held in Stehekin on December 5, 2011 and in Sedro-Woolley on December 7, 2011. No substantive comments were received during either of the meetings.

The park received 12 comment letters from individuals, agencies, and organizations, including Skagit Land Trust, Chelan County Noxious Weed Control Board, Okanogan County Noxious Weed Control Board, National Parks Conservation Association, Washington Native Plant Society, and Seattle City Light. The comments were reviewed and analyzed to identify substantive concerns. Nine of the respondents were in support of the Preferred Alternative (Alternative 2), while two were in support of Alternative 3 (IPM without Herbicides), and one did not specify support for a specific alternative. The main issues and concerns raised by the respondents included:

- Not using herbicides within the Park Complex in order to reduce pollution
- Not using herbicides in Stehekin in order to protect drinking water
- Elaborate on the reasoning behind not selecting the herbicide injection method to treat Japanese knotweed
- Spot spraying should be used as the primary means to apply herbicides rather than broadcast methods
- Pay more attention to outreach, education, and cooperation in order to strengthen invasive plant work
- Encourage WSDOT to provide more effective invasive plant control along SR 20

These points were covered in the EA. No issues emerged nor was any relevant environmental information received which had not already been considered in the development of the EA.

In addition to the above concerns, Seattle City Light (SCL) provided a number of comments, including a request for NPS to provide clarification on planning, management, reporting, and tracking requirements of invasive plants on SCL-owned lands and lands owned by NPS but located within the Skagit Hydroelectric Project boundary. Additional technical information about the City's IPM program was also provided, including the use of a tiering system developed by the Washington Toxics Coalition, and toxicological information specific to each proposed herbicide in the EA. Where information presented by SCL differs from that found in Appendix J of the EA, it is addressed in an errata prepared as a technical attachment to the EA. SCL also expressed concern that a number of the proposed chemicals would require a high degree of scrutiny if they were used by SCL. The NPS reaffirms that all chemicals used for invasive plant management and approved in this FONSI are screened and approved for use by the NPS through its servicewide Integrated Pest Management program for promoting and tracking least-toxic pesticide use (the Pesticide Use Proposal System).

CONSULTATION AND COORDINATION

CHELAN COUNTY NOXIOUS WEED CONTROL BOARD

In July 2010, park staff and members of the Chelan County Noxious Weed Control Board met to discuss progress on the Park Complex's Invasive, Non-native Plant Management EA, and to discuss the county's process of working with landowners to control knotweed (a Class B weed) throughout Chelan County. The EA was sent to the Board on November 17th, 2011 for review and comment. The Board responded in support of the Preferred Alternative (Alternative 2). Ongoing discussions about developing ways to coordinate knotweed control efforts on private and public land in the Stehekin Valley have occurred, and will continue.

NATIONAL MARINE FISHERIES SERVICE

Informal consultation with NMFS was initiated on March 27, 2012, when the NPS requested concurrence with its findings on impacts to federally listed anadromous fish species. The NPS determined that the actions proposed under the selected management alternative may affect, but are not likely to adversely affect Chinook salmon and steelhead. The NMFS concurred with the NPS' findings in a letter dated April 27, 2012.

NATIVE AMERICAN TRIBES

Park-associated, federally-recognized tribes, including the Colville Confederated Tribes, Nooksack Tribe, Sauk-Suiattle Tribe, Swinomish Indian Tribal Community, Upper Skagit Tribe, and Yakama Nation, were sent the EA on November 17th, 2011. Representatives for each of these groups were also given the opportunity to comment during the public scoping period. Though no comments from tribal representatives were received during either comment period, other opportunities will be forthcoming in those cases in which proposed projects to control or contain invasive plants become undertakings.

U.S. FISH AND WILDLIFE SERVICE

Informal consultation with USFWS was initiated on April 12, 2012, when the NPS submitted a letter requesting concurrence with its findings on impacts to federally listed species. The NPS determined that the actions proposed under the selected management alternative will have no effect on the marbled murrelet and Canada lynx; and the actions may affect, but are not likely to adversely affect the gray wolf, grizzly bear, northern spotted owl, and bull trout. The USFWS concurred with the NPS' findings in a letter dated April 27, 2012. The NPS agreed to reinitiate consultation in five years (2017) in order to reassess any change in potential impacts to listed species, and that proposed actions would be re-analyzed sooner than the five-year time frame if new information reveals that the action may affect listed species or designated critical habitat in a manner or to an extent not considered in the consultation; if the action is subsequently modified in a manner that causes an effect to a listed species or designated critical habitat that was not considered in the consultation; and/or, if a new species or critical habitat is designated that may be affected by the plan.

WASHINGTON STATE HISTORIC PRESERVATION OFFICE

The EA was sent to the Washington State Department of Archaeological and Historical Preservation (DAHP) for review and comment on November 17th, 2011. No comments were received. The SHPO will be contacted to initiate consultation if any of the proposed projects become undertakings. At this time, there is not enough information to identify an undertaking-determined area of potential effect (APE) or make a determination of effect consistent with section 106 of the National Historic Preservation Act of 1966 (as amended, 16 U.S.C. 470-470w-6) for the actions related to historic properties. Once identified, undertakings that have the potential to affect cultural resources eligible for or listed on the National Register of Historic Places will fulfill all procedural requirements specified in 36 CFR 800 (as amended in August, 2004).

CONCLUSION

Based on the environmental impact analysis contained in the Environmental Assessment, the mitigation measures designed to avoid, reduce, or eliminate potential impacts, and the results of public review and agency coordination, the National Park Service has determined that the selected alternative does not constitute a major federal action that would significantly affect the quality of the human environment. The selected alternative is not without precedent, nor is it similar to an action which normally requires an environmental impact statement. No connected actions with potential significant impacts were identified. Therefore, in accordance with the National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality, an Environmental Impact Statement will not be prepared.

RECOMMENDED

Superintendent, North Cascades National Park Service Complex **Date**

APPROVED

Regional Director, Pacific West Region **Date**

ATTACHMENT 1: DETERMINATION OF NON-IMPAIRMENT

THE PROHIBITION ON IMPAIRMENT OF PARK RESOURCES AND VALUES

NPS Management Policies 2006, §1.4.4, explains the prohibition on impairment of park resources and values:

> While Congress has given the National Park Service (NPS) management discretion to allow impacts within units of the national park system, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the NPS must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the 1916 Organic Act, establishes the primary responsibility of the NPS. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

WHAT IS IMPAIRMENT?

NPS Management Policies 2006, §1.4.5, What Constitutes Impairment of Park Resources and Values, and §1.4.6, What Constitutes Park Resources and Values, provide an explanation of impairment. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. §1.4.5 of Management Policies 2006 states:

> An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact is more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:
>
> - Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
> - Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
> - Identified as a goal in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Per §1.4.6 of Management Policies 2006, park resources and values at risk for being impaired include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and condition that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural

visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structure, and objects; museum collections; and native plants and animals;

- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the park was established.

An impact will be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park. The description of the parks' purpose and significance is found below and is subject to the no-impairment standard.

Description of Park Purpose and Significance

The North Cascades National Park Service Complex is comprised of North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area, a complementary suite of protected lands, united by a contiguous wilderness overlay. Combining these three distinct units under a single unique administration recognizes their shared purpose of preserving the core of the greater North Cascades ecosystem and wilderness while also advancing their individual purposes. The following statements summarize the significance of the Park Complex:

1. The North Cascades range reaches its finest expression in the North Cascades National Park, where a dense concentration of jagged glaciated peaks towers above alpine meadows and deep valleys and results in supremely majestic scenery.

2. The North Cascades National Park Service Complex contains more glaciers than any other protected area outside Alaska, representing one quarter of all the glaciers in the lower forty-eight states, and supporting ecosystems, communities and industries in the Puget Sound and lower Columbia River basins.

3. From deep forested valleys to alpine peaks, the North Cascades National Park Service Complex encompasses extreme gradients of climate and topography that contributes to an impressive diversity of habitats and species. This area is the core of a vast mountainous ecosystem of protected public lands spanning the border of the United States and Canada. The ecological integrity of the North Cascades National Park Service Complex and the greater North Cascades ecosystem depend on one another.

4. Envisioned as a wilderness park from its inception, the North Cascades National Park Service Complex is the core of over 2 million acres of federally designated wilderness, one of the largest such areas in the lower 48 states.

5. Preserved within North Cascades NPS Complex is abundant evidence of over 9000 years of cultural and technological development. This long history reveals a range of human adaptations to changing climates and environments at all elevations of the North Cascades.

6. North Cascades NPS Complex provides educational and scientific opportunities that support the understanding and preservation of park resources and values while contributing to public enjoyment and understanding.

7. North Cascades NPS Complex provides the wilderness traveler great challenges of physical endurance, route-finding and navigation through on- and off-trail hiking. The park contains climbing routes of high quality and aesthetic appeal, guarded by remote, rugged access and weather volatility, resulting in mountaineering experiences of solitude, mental and physical challenge and fulfillment.

8. The Skagit is the largest river draining into the Puget Sound. Abundant glaciers provide stable flows that help make it the only Puget Sound tributary to host all native species of anadromous fish and one of the highest concentrations of wintering Bald Eagles in the lower 48 states.

9. Ross Lake National Recreation Area provides a variety of high quality outdoor recreation opportunities, accommodating people with a wide range of interests and abilities.

10. Ross Lake provides diverse water-based opportunities where visitors can experience the scenic reservoir amidst a mountain wilderness where small or non-motorized watercrafts characterize recreation in this serene setting.

Impairment Determination for the Selected Alternative

With reference to the above, this determination of no impairment has been prepared for the approved program detailed in the FONSI as the Selected Alternative. As explained above, no impairment determination is provided for the following analyzed impact topics: visitor experience, human health and safety, socioeconomics, and park operations. This is because impairment findings relate back to park resources and values, and the above impact topics are not generally considered to be park resources or values according to the 1916 Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

Soils

The selected alternative will not result in impairment because although there will be short-term, minor to moderate adverse impacts to soils as a result of herbicide treatments, long-term beneficial impacts will occur as areas recover and are better able to support natural soil functions. Restoration efforts could speed the recovery process for disturbed sites by returning organic matter, nutrients, and moisture back into the soil.

Hydrology and Water Quality

Water resources are necessary to fulfill the purposes for which the park units were established, and are key to the natural integrity and enjoyment of the park units. The selected alternative will not result in impairment because although there will be short-term, minor adverse impacts to hydrology and water quality as a result of herbicide treatments, long-term beneficial impacts will occur as areas recover and are better able to support natural hydrologic processes and water quality.

Wetlands

The selected alternative will not result in impairment because although there will be short-term, minor adverse impacts to wetlands as a result of herbicide treatments and mechanical removal, long-term beneficial impacts will occur as areas recover and natural conditions are improved. Special consideration for invasive plant treatments in or near wetlands will be taken, and include: treatments in seasonally flooded wetlands and riparian areas will be scheduled during the dry or low water phase of the year, or during reservoir draw down, and appropriately labeled herbicide formulations will be used in wetlands and within 10 feet of standing and moving water.

Vegetation

Healthy, native terrestrial and riparian vegetation is necessary to fulfill the purposes for which the park units were established, and is key to the natural integrity and enjoyment of the park units. The selected alternative will result in adverse impacts during invasive plant treatments, such as vegetation removal and non-target impacts to native vegetation, but will result in long-term beneficial impacts as areas recover and can better support natural ecosystem processes. Recruitment of native plants and an increase in native plant diversity will occur.

Fish and Wildlife, including Rare, Threatened, and Endangered Fish and Wildlife

The selected alternative will not result in impairment to fish or wildlife species because although there will be short-term, negligible to moderate adverse impacts to fish and wildlife as a result of herbicide treatments and disturbance, long-term beneficial impacts will occur as areas recover and are better able to support native fish and wildlife species. Habitat restoration efforts will benefit many listed fish and wildlife species.

Cultural Resources

Each project proposed in this EA constitutes a federal undertaking. Prior to any undertaking the NPS will make an assessment of its effect to cultural resources. There are three projects proposed to take place within National Historic Districts. These include the Buckner Homestead Historic District, the Stehekin Landing (includes the Golden West Historic District), and the Marblemount Ranger Station Historic District. Invasive plants will be treated at all three of the identified cultural resource sites. Other invasive plant project locations will undergo a cultural resource survey prior to treatment in order to prevent impacts to undiscovered cultural sites.

Cultural resources are key to the cultural integrity of the Park Complex and to the opportunity for enjoyment of the park. The selected alternative will not result in impairment to cultural resources

because mitigation measures will be followed to protect known cultural resource sites, and surveys will be conducted prior to treatments to detect previously undiscovered sites

WILDERNESS

Seven identified projects will be undertaken within designated wilderness: Stehekin Valley Cheatgrass, Stehekin Knotweed (less than one percent occurs within wilderness), Big Beaver Creek Reed Canarygrass, Ridley Lake Reed Canarygrass, Ruby Pasture, Thornton Lake Road, and Park-wide Trails. Short-term, moderate impacts to the untrammeled quality of wilderness character will occur, primarily because the Stehekin Cheatgrass project is relatively large in scope (almost 2,000 gross infested acres, a subset of which (approximately 60 known acres) will be spot treated with herbicide). Evidence of human control or manipulation may be noticeable after treatment, but temporary because as vegetation communities are restored, evidence of the project activities will disappear.

The potential use of a motorized water pump for the Stehekin Cheatgrass project could impact the undeveloped quality of wilderness character. This minor impact will be extremely localized and temporary, since the pump produces little noise and will only be used to fill water storage containers during project treatment. Opportunities for solitude or a primitive and unconfined type of recreation will experience negligible impacts. The largest number of invasive plant treatments will occur under this alternative, but most will go largely un-noticed by most visitors. This impact will be mitigated by timing of treatments during shoulder seasons and/or the weekday when fewer visitors are in the backcountry.

Long-term beneficial impacts to the natural quality of wilderness character will occur under this alternative, as all infestations will be treated. These infestations will be eradicated and prevented from spreading further into wilderness, thus protecting naturalness.

Wilderness is key to the opportunity for enjoyment of the park units. The selected alternative will not result in impairment to wilderness because although there will be short-term adverse impacts ranging from negligible to moderate that will occur to untrammeled, undeveloped, and opportunities for solitude or unconfined recreation, long-term beneficial impacts will occur to the natural quality.