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## PACIFIC WEST REGIONAL OFFICE Memorandum

L7617 (PWRO-PP)

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### Memorandum

To: Superintendent, Yosemite National Park

From: Regional Director, Pacific West Region

Subject: Environmental Compliance for Updated Invasive Plant Management Plan

The *Finding of No Significant Impact* for the updated program to detect and control or eradicate invasive non-native plants is approved (original plan approved September 17, 2008).

To complete this particular compliance effort, at the time when the park announces the decision, the *Errata* prepared to document minor text changes in the supporting environmental assessment (EA) should be distributed to all recipients of the EA, with instructions to attach to their copy so as to have a full and complete record of the environmental analysis and conservation planning underlying this endeavor.

Christine S. Lehnertz

Attachments:2



# Finding of No Significant Impact Invasive Plant Management Plan Update

August 2011

## Introduction

This Finding of No Significant Impact (FONSI) documents the decision of the National Park Service (NPS) to adopt the *Invasive Plant Management Plan Update Environmental Assessment* (2010 IPMP Update EA) which will supersede the *2008 Invasive Plant Management Plan EA* (2008 IPMP, NPS; FONSI signed in 2008), and documents the determination that no significant impacts on the human environment associated with that decision (in accordance with 40 CFR 1505.1). The NPS prepared the *2010 IPMP Update EA* according to the National Environmental Policy Act of 1969 (NEPA) and Director's Order #12 guidelines. The Selected Alternative in the *2010 IPMP Update EA* is consistent with all applicable federal laws, NPS policies, and park plans. The update provides a more comprehensive and adaptive framework for guiding a program for protecting the park's natural and cultural resources from the growing threat posed by invasive plants.

## Purpose

In Executive Order 13112, an invasive species is defined as "*non-native (or alien) to the ecosystem under consideration*" and "*likely to cause economic or environmental harm or harm to human health*." Invasive plants continue to spread into non-infested areas, making it increasingly difficult for the park to achieve its overarching goal of protecting natural and cultural resources. Although the *2008 IPMP EA* provides the park with control options for treatment of invasive plants, it is not flexible enough to afford the park with the needed array of programmatic, adaptive management control methods and tools to eradicate or sufficiently limit the spread of invasive plants within the park.

The intent of the *2010 IPMP Update EA* is not to change or replace the main purpose or goals of the existing plan, but rather to build upon the plan and provide a more adaptive framework for responding to the challenges of managing invasive plants. An additional goal is to establish guidelines for the use of various management techniques and tools, including a framework for assessing the efficacy of additional herbicides while maintaining safety standards for workers and the environment. Specific deficits in the *2008 IPMP EA* are addressed, such as minimum patch size and density limits on herbicide use, which limit the park's ability to eradicate new invasive plant populations while they are still of a manageable size. Limitations on methods used for managing invasive species, such as a 10-foot buffer near water, are addressed. The *2010 IPMP Update EA* assesses a no-action alternative (the existing *2008 IPMP EA*), and two action alternatives for their effectiveness in managing non-native invasive plants and protecting these resources. Like the *2008 IPMP EA*, this environmental assessment outlines programmatic invasive plant management decision-making and prioritization strategies. Both continue invasive plant management efforts that began in the 1930s with the Civilian Conservation Corps.

## Need

The main impetus for updating the *2008 IPMP EA* arose from the 2009 Big Meadow Fire, when park managers realized they did not have the flexibility to use the most effective tools available to combat the spread of cheatgrass (*Bromus tectorum*). A “transformer species,” cheatgrass often forms monotypic stands, thus greatly altering native species’ cover and richness, resource availability, trophic structure, and ecosystem productivity (Richardson, Pyšek, Rejmánek, et al. 2000). Disturbance regimes, including fire frequency and intensity, are also affected. Cheatgrass is still expanding its range into meadows and grasslands in the Sierra Nevada, and has been documented at elevations above 9000 feet (D’Antonio et al. 2004, see Bibliography, *21010 IPMP Update EA*). Following the fire, the Burned Area Emergency Rehabilitation Team recommended applying rimsulfuron, a pre-emergent herbicide, to prevent cheatgrass seeds from sprouting and overtaking Big Meadow. However, because the suggested herbicide was not evaluated and approved for use in the *2008 IPMP EA*, the park was unable to use this tool. The inability to treat cheatgrass effectively is just one of the many invasive plant management challenges faced by the park.

## Legislative and Planning Context

The *2010 IPMP Update EA* is consistent with federal and state laws, regulations, and NPS policies and plans. This plan has been prepared with review and input according to NEPA, Director’s Order #12, the Endangered Species Act (ESA, Sec. 7), and NHPA (Sec. 106). The Organic Act of 1916 is the legal foundation of NPS regulation and policy. The NPS *Management Policies* (NPS 2006b) are the primary policy documents of the NPS. Legislation and policy specific to Yosemite National Park include the enabling legislation for Yosemite National Park, and the *General Management Plan* (NPS 1980). The *General Management Plan* provides overall management direction for Yosemite National Park. The *2010 IPMP Update EA* tiers off of the *General Management Plan*. The Wilderness Act of 1964 established regulations for protecting and managing federal lands set aside as Wilderness. The California Wilderness Act of 1984 designated tens of thousands of acres in Yosemite National Park to be managed as Wilderness. NPS wilderness stewardship is guided by NPS Management Policies Chapter 6; Reference Manual #41; and Director’s Order #41 (currently in review).

The development and review of the plan follows NHPA Sec. 106 guidance and is consistent with the *1999 Programmatic Agreement among the National Park Service at Yosemite, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation Regarding Planning, Design, Construction, Operations and Maintenance, Yosemite National Park, California* (1999 PA).

In 1999, President Bill Clinton signed Executive Order 13112 to prevent the introduction and spread of invasive species. This federal directive provides guidance for the management of invasive species on federal land. NPS Management Policies state, “Exotic species will not be allowed to displace native species if displacement can be prevented . . . In general, new exotic species will not be introduced into parks.” All methods, including those prescribed for herbicide handling and use under this program conform to federal and state regulations regarding herbicide use and water quality protection.

## **Alternatives Analyzed in the Environmental Assessment**

The *2010 IPMP Update EA* presents three management alternatives and provides environmental impacts analysis of each. These include: *No Action* (Alternative 1); *Add Four Herbicides and Address Limitations of Existing Plan* (Alternative 2); and *Adaptive Management* (Alternative 3). A public review of the document was held from December 15<sup>th</sup>, 2010 through January 30, 2011. This FONSI presents changes and clarifications to Alternative 2 based on comments received on the EA from agencies, American Indian tribes and groups, and the public (see *2010 IPMP Update EA* and Errata Sheets).

### **Overview of the Alternatives**

Under Alternative 1, the no-action alternative, current invasive plant management practices would continue in the park. Park employees and volunteers would use an integrated pest management approach to detect, control, and prevent high and medium-high priority invasive plants (those with the highest potential to invade natural communities in the park) from spreading into non-infested areas. Park crews would use two approved herbicides to control up to 22 invasive plant species if management objectives could not be achieved by the use of other control methods and if invasive plant populations met size and location thresholds.

Under Alternative 2, the *Selected Alternative*, park employees and volunteers would continue to use an integrated pest management approach to protect park natural and cultural resources from displacement or other degradation resulting from the introduction and spread of invasive plants. Language in the no-action alternative that restricts park resource managers' ability to protect natural and cultural resources from non-native invasive plants would be changed. This change would include modifying limitations on herbicide use in designated Wilderness, near water, and in traditional gathering areas. (Special protections for sensitive areas still apply; see mitigation measures, Table III). Four additional herbicides are proposed for use.

Alternative 3 would build upon Alternative 2 and introduce an adaptive management protocol to allow for more effective proactive protection of park natural and cultural resources from displacement or other degradation resulting from the introduction and spread of priority invasive plants. Herbicides would be assessed for inclusion in the park's toolbox using a decision tree, a literature review, and expert consultations. In Alternative 3, the need for application of herbicides in water for controlling aquatic invasive species would be assessed using a similar process.

The following table (Table II-1) provides a summary comparison of the alternatives (updated/revised in response to public comments; see Errata and Public Comment Summary).

**Table II-1: Alternatives Comparison, 2010 IPMP Update EA**

<b>Common to All Alternatives</b>	<b>Alternative 1: <i>No Action</i> (2008 IPMP EA)</b>	<b>Alternative 2: <i>Add 4 Herbicides and Address Limitations in 2008 IPMP EA</i> (Selected Action)</b>	<b>Alternative 3: <i>Adaptive Management</i></b>
<ul style="list-style-type: none"> <li>• Integrated Pest Management (IPM) Program includes inventory, prioritization, prevention, treatment (physical, cultural, chemical and biological), monitoring, outreach and education</li> <li>• Annual work plan (online) reviews past work and presents next season's treatment methods, tools, times, and areas</li> <li>• Minimum Requirements Analysis (MRA) conducted for all management actions in designated Wilderness</li> <li>• Use herbicides approved by NPS and U.S. and California Environmental Protection Agencies</li> <li>• Herbicide applications follow federal label guidelines</li> <li>• <i>Best Management Practices</i> and mitigations used for treatment near wetlands and riparian areas</li> <li>• Ongoing consultation and cooperative management with associated tribes and groups to protect cultural resources, cultural use plants, and those who gather cultural use plants</li> </ul>	<ul style="list-style-type: none"> <li>• 2008 IPMP EA guides current Program</li> <li>• <i>Glyphosate</i> and <i>aminopyralid</i> used to control priority invasive plants</li> <li>• Plan limitations:               <ul style="list-style-type: none"> <li>-Herbicides only used when invasive plant populations meet size and density thresholds, and control not achieved by other methods</li> <li>-Herbicide use limited to 2 species in Wilderness and 22 species in front country</li> <li>-No herbicide use in traditional gathering areas</li> <li>-10' herbicide use setback from water</li> <li>-Herbicides not applied below the ordinary high-water mark of Wild and Scenic Rivers or their tributaries</li> <li>-100' herbicide use buffer from blue elderberry to protect federally threatened elderberry longhorn beetle</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Add 4 herbicides (<i>rimsulfuron</i>, <i>triclopyr</i>, <i>chlorsulfuron</i>, <i>imazapyr</i>). These are appropriate in wildlands, and enable treatment of established or potential invasive species</li> <li>• Address limitations in 2008 IPMP:               <ul style="list-style-type: none"> <li>- Remove patch size and density herbicide use thresholds that inhibit treatment while infestations are still small</li> <li>- Only aquatic herbicide formulations will be used in wetlands, riparian areas and near water; treatment will occur at lowest possible water levels.</li> <li>- Aquatic herbicides may be applied to waterline, but not in water</li> <li>-Management in traditional gathering areas will consider all available treatment options. The appropriate treatment method will be selected following consultation and information sharing, and in cooperation with American Indian tribes and groups.</li> <li>- Mitigation to protect federally-threatened elderberry longhorn beetle (USFWS 6/23/2010, 7/28/2011) includes a no herbicide spray buffer 30' from drip line of blue elderberry plants. Herbicide may be hand- applied (cut and dab) within 30' of drip line, outside of the flight season (March 1 through June 30).</li> </ul> </li> <li>• Water quality monitoring 1<sup>st</sup> season; before and after treatment of 2 largest riparian blackberry patches in Yosemite Valley.</li> <li>• For addition of new herbicides, a NEPA process would be initiated to prepare a supplemental EA, with public scoping, specification of purpose and need, proposed herbicide, an analysis of impacts, and a 30-day public review period.</li> <li>• For emergencies such as the discovery of a rapidly spreading new species for which approved herbicides are ineffective, the Superintendent can approve a CE for a limited effort to treat known populations with EPA- approved herbicides. Simultaneously, NPS would initiate a supplemental EA, as above.</li> </ul>	<ul style="list-style-type: none"> <li>• Add 4 herbicides (see Alternative 2)</li> <li>• Address limitations in 2008 IPMP (see Alternative 2)</li> <li>• <i>Management</i> in tribal gathering areas will consider all available treatment options. The appropriate treatment method will be selected following consultation and information sharing, and in cooperation with American Indian tribes and groups.</li> <li>• Adaptive management allows park to respond rapidly to new challenges and apply new tools and methods, including:               <ul style="list-style-type: none"> <li>-Protocol for evaluating new herbicides for potential use in park</li> <li>-Periodically review program to inform management about effectiveness for protecting resources from invasive plants</li> <li>-Protocol for considering aquatic herbicides in water for extreme invasions such as <i>Hydrilla</i></li> </ul> </li> </ul>

## **Actions Common to All Alternatives**

Development of the park's Invasive Plant Management Program has been guided by park policies and principles of Integrated Pest Management (IPM), principles that have evolved and gained wide acceptance in the past 50 years. By law, federal agencies are required to use an IPM approach (IPM, 7USC136r-1). The law applies to all activities involving planning, procurement, prevention, design, detection, control, and management of native and non-native pest species on Department of the Interior lands and properties. Integrated pest management is defined in Chapter 1; it includes inventory, prioritization, prevention, treatment, and monitoring. Research, along with education and outreach, is also discussed. Descriptions of the various alternatives are organized around these facets of IPM.

### **Best Management Practices**

- Select the most appropriate tool for controlling individual species or infestations.
- Determine measures needed to protect natural and cultural resources such as cultural use areas, designated Wilderness, water resources, and sensitive species habitat (see Mitigation Measures Table, below).
- Use only herbicides approved by NPS and U.S. and California Environmental Protection Agencies and follow all state and federal regulations pertaining to herbicide handling, application, and storage.
- Use only aquatic-approved formulations of herbicides in wetlands and within 10 feet of water.
- Target only individual invasive species populations.
- Apply herbicides only when meteorological conditions are suitable (heat, wind speed and direction, humidity and precipitation), as defined on the label. Target invasive species patches and avoid spraying native plants to the greatest extent possible.

### **Wilderness Minimum Requirements Analysis**

The Wilderness Act of 1964 established regulations to protect wilderness, and provides guidance for preservation of wilderness character, and sets prohibitions on use. The NPS conducts Minimum Requirements Analysis (prepares MRAs) to review actions proposed in wilderness, to ensure they meet conditions of the Act that preserve wilderness character (qualities include *untrammeled, natural, undeveloped, and outstanding opportunities for solitude or primitive recreation*), and other purposes for which it was established.

Invasive species are a threat to natural and cultural resources in Wilderness and to the natural quality of Wilderness character. For this plan update, an MRA was conducted to determine the minimum requirement under IPM for protecting wilderness character from non-native, invasive species (see attached). Under IPM, physical, cultural and herbicide control methods would be used. Each of those methods could be considered the minimum tool, depending upon which is appropriate for controlling a particular species, as identified in the MRA. During work planning, managers identify the minimum tool for the task. All methods, including herbicide use, shall meet the conditions of the Wilderness MRA.

## Special Protection Zones

Some areas of the park have been identified as having highly sensitive resources that warrant special consideration during planning for invasive species control or treatment. The NPS is responsible for maintaining and protecting these sensitive resources, and staff must take special precautions in such areas. These areas include traditional gathering areas, play areas and school grounds, special status species habitats, designated Wilderness, and Wild and Scenic Rivers. The Mitigation Measures Table that follows lists the special considerations that managers must take into account.

## Monitoring and Reporting

Invasive plant control efforts are monitored to determine whether management objectives are being met, to ensure the effectiveness of control techniques, and to ensure that control efforts aren't having unintended/non-target impacts. Monitoring provides valuable information on the abundance, location, extent, and rate of spread of non-native species over time, and offers insight into the mechanisms and vectors that promote their spread. The quality of monitoring data is dependent on the sufficiency of baseline inventory information. The extent of monitoring can vary from year to year depending upon the needs of the program and the availability of funding and staff. The most effective monitoring goals are those that are feasible, easily quantifiable, and time specific. Monitoring includes the following:

- ***Efficacy monitoring*** of control and prevention efforts is used by program managers to determine whether objectives are being met through treatment actions over a period of time
- ***Non-target effects monitoring is conducted by the program manager and by resource specialists to ensure that*** unintended consequences of management actions do not adversely affect non-target resources. When non-target effects are detected, corrective actions are taken that may include halting specific treatment methods, reviewing with resource specialists, and adjusting methods, timing, or locations of specific locations to avoid impacts.
- ***Corrective actions monitoring is done*** to ensure corrective actions were effective.
- ***Ecological restoration monitoring***, is done to evaluate whether the management actions achieved goals or desired conditions to re-establish natural species composition, structure and processes over time.

Annual work plans are developed and posted on the park's Invasive Plant Management Program webpage before each field season at:

<http://www.nps.gov/yose/naturescience/invasive-plant-management.htm>.

These plans are sent to American Indian tribes and groups associated with Yosemite National Park as part of consultation, and are posted online for review by the general public. Managers review the professional and scientific literature, review the results of park studies and the previous season's treatment actions, and consult with staff and other subject matter experts in order to select the most appropriate treatment methods and mitigations. Park-associated tribes and groups, as well as the public, are notified of the proposed treatment schedule, locations, methods and tools.



## **Selected Alternative - Alternative 2: Add Four Herbicides and Address Limitations in 2008 IPMP**

After careful consideration, the park has selected Alternative 2, *Add Four Herbicides and Address Limitations in 2008 IPMP*. The Selected Alternative in the *2010 IPMP Update EA* is consistent with all applicable federal laws, NPS policies, and park plans. The following modifications and clarifications have been made which provide more detail (see Mitigation Measures Table and Errata), and address comments and concerns raised by the public, agencies, and associated American Indian tribes and groups during the comment period on the EA (see Public Comment and Response Report).

Under Alternative 2, invasive plant management planning is based upon the principles of IPM, with control methods including manual, mechanical, cultural, herbicides, and very limited biological controls (See Actions Common to All). Compared to the No Action Alternative, Alternative 2 builds upon the *2008 IPMP* by increasing treatment methods and tools available for use in order to meet the program's stated purpose and need:

- Add 4 new herbicides (rimsulfuron, triclopyr, chlorsulfuron, and imazapyr) which are appropriate for use in wildlands and enable treatment of the broadest spectrum of invasive species likely to enter the park
- Alternative 2 will address limitations in the *2008 IPMP* including:
  - Removing individual patch size and density limits for herbicide use, which limited ability to treat infestations while they are still small
  - Clarifying and refining treatments and methods appropriate for sensitive areas such as traditional gathering areas, near water, and in Wilderness.

### ***Clarifications and modifications made to Alternative 2 (Selected Action):***

The following clarifications and modifications have been made to the Selected Action: Alternative 2, in response to comments and suggestions submitted by the public, staff, agencies, and American Indian tribes and groups.

- Management in traditional gathering areas will consider all treatment options. The appropriate treatment will be selected following consultation and information sharing, and in cooperation with park-associated American Indian tribes and groups.
- Treatment in wetlands and riparian areas will occur during dry season and/or low water levels, Aquatic approved herbicides may be applied up to the waterline, but not in water.
- Water quality monitoring will occur 1st season; before and after treatment of the two largest riparian blackberry patches in Yosemite Valley.
- Based on consultation, the mitigation to protect federally-threatened elderberry longhorn beetle (USFWS 6/23/2010, 7/28/2011) has been modified (see Consultation section and Mitigations Table).
- Data and results of monitoring are reported annually, and can be viewed online at: <http://www.nps.gov/yose/naturescience/invasive-plant-management.htm>

- For addition (or replacement) of new herbicides, a NEPA process would be initiated to prepare a Supplemental EA, with public scoping, specification of purpose and need, proposed herbicide, an analysis of impacts, and a 30-day public review period.
- For emergencies, (e.g., discovery of a rapidly spreading new infestation for which approved methods were ineffective), the Superintendent could approve (under a Categorical Exclusion according to NEPA) a limited effort to treat known populations of a species of concern with a new herbicide (EPA approved, field-tested, recommended by independent technical and agency experts) if necessary. Simultaneously, a Supplemental EA would be initiated, as described above.
- Protocol for selecting the appropriate method has been clarified with a revised Figure II-2 (page II-23).

## Alternatives Considered

In addition to Alternative 2, the Selected Alternative, the following two alternatives were fully described and analyzed for consideration in the *2010 IPMP Update EA* (with corrections as noted in the Errata):

### **Alternative 1: No Action (Continue Current Management)**

Under Alternative 1 (No-Action alternative), the existing *2008 IPMP* would be maintained. The existing plan guides a program staffed by park employees and volunteers for managing the priority invasive plant populations that pose the greatest threat to park natural and cultural resources and that have the highest feasibility for control. Management is based upon the principles of integrated pest management, the components of which include inventory, prioritization, prevention (including early detection and eradication), control, and monitoring.

Physical and mechanical treatments would be emphasized, although, under certain conditions, two herbicides, glyphosate and aminopyralid, are used to control certain priority species. Eleven species throughout the park are currently treated using herbicides in the 5% of Yosemite National Park that is not designated Wilderness, and two species are treated using herbicides in Wilderness. Criteria used to consider the use of herbicides on new species or in new areas include prioritization, species-specific management objectives, herbicide effectiveness, and population size and location criteria thresholds. Annual work plans notify the public as to the time and planned locations for management efforts, as well as the methods and tools that would be used.

Program goals include: 1) prevention of the introduction of new invasive plant seeds and other propagules; 2) early detection and eradication of newly introduced populations; and 3) containment and, if possible, eradication of existing populations. Under Alternative 1, herbicide use is limited, especially near water.

### **Alternative 3: Adaptive Management**

The purpose of this alternative is to ensure that the park has the necessary flexibility to use the best available tools and methods to combat invasive plants. Control methods would include physical, mechanical, cultural, herbicide, and very limited biological controls – only biological control agents that have already been released within the park. As with Alternative

2, four new herbicides would be added. Also, specific sections of the no-action alternative that limited the ability of resource managers to protect the park's natural and cultural resources from non-native invasive species, would be addressed.

This alternative includes a protocol for assessing additional herbicides for use in the park, and for considering the use of herbicides near and in water to treat aquatic invasive plants. These protocols would be based upon a screening process that includes national, state, regional, local, and Yosemite-specific considerations.

Alternative 3 builds upon Alternative 2, and includes an adaptive management component; a process that promotes flexible decision making and program adjustments in the face of uncertainties and ecosystem variability (Williams, Szaro and Shapiro 2007; Prato 2006, see Bibliography, *2010 IPMP Update EA*). Thus, invasive plant management in Yosemite could be constantly improved by using the results of monitoring and new information to respond proactively, as appropriate, to changing conditions with new and innovative techniques.

### **Alternatives Considered but Dismissed**

The NPS considered a range of actions when developing possible alternatives for the *2010 IPMP Update EA*. Of the alternatives considered, some were dismissed without further analysis, for one or more of the following reasons:

- The action does not satisfy the program's purpose and need.
- Less environmentally damaging options are available.
- The action will cause unacceptable environmental, cultural, or social impacts.
- The action presents unacceptable risks or constraints with an associated increase in costs.
- The action will be inconsistent with law, regulation, or policy.

In the *2008 IPMP*, the park fully considered and analyzed an alternative that excluded the use of herbicides. However, it was dismissed because it would not meet the purpose and need. This was suggested in public comment, and again considered carefully but formally dismissed by the planning team during the alternatives development workshop for the current plan because this approach would not allow the park to use the best available science and tools nor would it adequately address the threat, or meet the park's directive to protect the park's natural and cultural resources for future generations. Other Alternatives considered but dismissed included use of domestic herbivores to control invasive plant populations, use of biological control agents, and use of aircraft for aerial herbicide application.

## Environmentally Preferable Alternative

The NPS, in accordance with NEPA (Section 101(b) 516 DM 4.10), defines the environmentally preferable alternative as the alternative that best promotes the national environmental policy. The NPS is required to identify the environmentally preferable alternative in the environmental documents it produces for public review and comment. The Council on Environmental Quality's *Forty Questions* further defines the environmentally preferable alternative as "the alternative that causes the least damage to the biological and physical environment... [and that] best protects, preserves, and enhances historic, cultural, and native processes." The environmentally preferable alternative must meet the following six requirements described in Section 101 of NEPA:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Assure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans.
- Attain the widest range of beneficial use of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and, wherever possible, maintain an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative 1, *No Action*, seeks to meet the environmental policy goals by initiating a program to protect non-infested areas of Yosemite National Park from invasions of high- and medium-high-priority invasive plants. The park would selectively use herbicides only in the event that park staff is unable to meet management objectives via manual or mechanical control methods. Glyphosate and aminopyralid would be used to control 22 invasive plant species in the 5% of the park that is non-wilderness, and two invasive species in the 95% of the park that is designated Wilderness, providing certain population size and density thresholds are met.

Alternative 2 seeks to meet environmental policy goals by adding four additional herbicides to control a broad range of invasive plant species. Additionally, language within the *2008 IPMP* which unnecessarily limit the effectiveness and efficiency of invasive plant management actions within Yosemite National Park would be rectified.

Alternative 3, like Alternative 2, includes adding four herbicides and addressing limitations within the *2008 IPMP*, while adding adaptive management to allow for flexible decision making that could be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood.

After careful review of comments, and further analysis, NPS concludes that Alternative 2, as refined and described above, is considered the environmentally preferable alternative because overall it best meets the requirements in Section 101 of NEPA. This is because, with its more conservative approach, Alternative 2 may more closely achieve the requirement to "attain the widest range of beneficial use of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences." Alternative 3

potentially met this requirement, but with greater uncertainty. Also, the public raised specific concerns regarding risks to health and safety, and were skeptical about the park's ability to accurately predict or prevent the unintended consequences of adding new herbicides that hadn't been specifically analyzed in the *2010 IPMP Update EA*, or of applying herbicides directly in water.

Compared to the No Action Alternative, Alternative 2 more effectively fulfills the responsibilities of each generation as trustee of the environment for succeeding generations by allowing for better, more efficient control of non-native plants and the impacts they create on the environment. Alternative 2 allows NPS to implement policy to continue to applying the well-recognized scientific principles of adaptive management in the overall program through research, monitoring, data analysis, reporting, and work planning that responds to new information to continually improve the program.

By adding four herbicides which can control a wide range of invasive species, and addressing limitations with the existing plan, Alternative 2 allows for effective non-native plant control while minimizing resource degradation, health and safety risks, and other undesirable or unintended consequences. More effective management of non-native plants is necessary to preserve important natural and cultural aspects of our national heritage. Without such management action, non-native species will continue to adversely impact native vegetation and the wildlife that depends on it.

## **Why the Selected Alternative Will Not Have a Significant Effect on the Human Environment**

The NPS analyzed the ten significance criteria as defined in the Council on Environmental Quality's NEPA regulations (Section 1508.27) to determine if the Selected Alternative will have a previously undisclosed significant adverse effect on the human environment. The NPS has determined that none of the significance criteria are triggered under the Selected Alternative. No highly uncertain or controversial impacts, unique or unknown risks, or elements of precedence have been identified. Implementing the Selected Alternative will not violate any federal, state, or local environmental laws. The Selected Alternative will remove invasive plants that threaten the integrity of biological and other resources.

Under the Selected Alternative, the NPS would manage priority invasive plant species using a variety of physical, mechanical, chemical, and other control techniques. This includes adding four herbicides to treat invasive species that the two herbicides approved under the existing plan cannot efficiently treat. The additional herbicides are approved by the U.S. and California environmental protection agencies and have been recommended by invasive plant researchers, toxicologists, and resource management specialists. These herbicides were assessed for toxicity, bioaccumulation, acute impact, half-life in water and soil, and mechanisms of degradation.

Best management practices and mitigation measures are included in the Selected Alternative to protect sensitive cultural and natural resources and avoid or minimize adverse impacts. Potential impacts to resources under the Selected Alternative have been described and analyzed in the EA, and the conclusions for each resource topic are noted below:

## **Soils**

Ground-disturbing activities may result in short-term negligible adverse effects on soil microorganisms, soil chemistry, and hydrologic cycles. The currently used and proposed herbicides and their associated adjuvants, surfactants, and “inert” ingredients, could have a short-term negligible adverse impact on soil quality in the immediate area where they are used. However, using herbicides instead of physical methods would result in reduced soil disturbance where plants would otherwise be pulled or dug up by their roots. Allowing herbicide use to the water line and within the beds and banks of Wild and Scenic rivers would allow for more effective control of invasive species on wetland and riparian soils. This would result in a short-term negligible adverse impact on soil quality in the immediate area where they are used but also a long-term moderate benefit to wetland and riparian soils as the vegetation growing on these soils was prevented from being displaced by non-native plants. Overall, preventing future infestations and limiting the spread of current infestations under the Selected Alternative would keep invasive plants from displacing native plant communities. This would result in moderate long-term, parkwide beneficial impacts on soil microorganisms, soil chemistry, and hydrologic cycles in areas where invasive plant populations are removed, and in long-term minor benefits at the scale of the entire park.

## **Hydrology and Water Quality**

Under the Selected Alternative, the NPS would use aquatic herbicide formulations to the edge of standing or moving water, and will not use herbicides in standing or flowing water. Best management practices and mitigations are included to protect water quality and the birds, mammals, amphibians and invertebrates that depend up on it. Ground-disturbing activities from physical removal of invasive plant roots near streams could result in negligible, short-term increases in sediment loading or turbidity. The use of weed trimmers and other motorized and non-motorized equipment would result in negligible short-term increases of contaminant inputs to park waters. The ability to spray to the water line would be of particular importance in the control of certain non-native invasive species. Because of their low toxicity and targeted application, the use of herbicides under the selected alternative, is expected to only have short-term, local, negligible adverse impacts to water quality. There would be a parkwide, negligible, positive benefit to water quality in the long term as invasive plant populations near water are controlled.

## **Wetlands**

Under the Selected Alternative, work crews would use manual, mechanical, and cultural methods and also aquatic-approved herbicide formulations to the water's edge. Herbicides would not be applied to standing or flowing water. Manual, mechanical and cultural control methods, and also the use of herbicides to the waterline, could result in localized, short-term negligible adverse impacts. However, the use of herbicides will allow the park to meet management objectives for invasive plants with the potential to invade wetlands that otherwise will not be controlled using manual and mechanical techniques. Overall,

implementation of the Selected Alternative would have a long-term minor to moderate beneficial impact on wetlands.

## Vegetation

Under the Selected Alternative, actions taken to control invasive species, whether physical, cultural, chemical, or other, would not result in more than localized short-term negligible adverse impacts to vegetation. Past impacts on vegetation from invasive plants have been adverse, long-term and major. The most effective and appropriate tool will be used to protect native plant communities from being degraded or displaced by invasive species, implementation of the Selected Alternative would result in long-term moderate beneficial impacts to native vegetation in the park.

## Special-status Plants

No federally listed plants are documented within Yosemite National Park or the El Portal Administrative Site. Four species listed as Rare by the state of California are present (*Allium yosemitense*, *Carex tompkinsii*, *Eriophyllum congdonii*, *Lewisia congdonii*). An additional 146 special status plants found within park boundaries are designated Park Sensitive. Under the selected alternative, physical, mechanical, and herbicide treatments would allow the park to meet management objectives for priority invasive species that have the potential to invade natural ecosystems. Herbicide use may result in short-term negligible adverse impacts to adjacent vegetation. Compared with manual and mechanical treatments, the use of herbicides would reduce the extent and intensity of soil disturbance. And, an herbicide could be the proper tool, even where it may result in a short-term localized adverse impact on a special status individual or population, if it protected the habitat of a special status species from being displaced across large spatial scales by a particular invasive species.

## Wildlife

Actions proposed for the Selected Alternative will protect and restore habitat for native wildlife species within the park. Best management practices and mitigation measures included in the alternative protect individuals and wildlife populations from non-target effects of treatments. The use of manual, mechanical and cultural control techniques, as well as the use of existing and proposed herbicides would not result in more than short-term, negligible negative impacts to individual animals or species populations. However, allowing invasive plants to continue to spread could result in negative impacts to large areas of wildlife habitat. Protecting wildlife habitat from displacement by native species would result in long-term, moderate to major, beneficial impacts to park wildlife.

## Special-Status Wildlife

*Special- status wildlife* include federal- and state- listed threatened, endangered, and candidate species, and other park species of concern (see *Consultation and Coordination*, below, and Table III-3 in the *2010 IPMP Update EA*). Best management practices and mitigation measures to protect special status species and habitats are in place to avoid and minimize impacts to these species (e.g., pre-treatment surveys, the use of only aquatic - approved herbicides in riparian areas, and working in wetland habitats during dry periods, to avoid impacts to sensitive amphibians).

The use of herbicides near water and the addition of four more herbicides under the Selected Alternative may have localized, short-term, negligible adverse effects on individuals of

special status wildlife species. The presence and activities of staff pulling, digging, spraying, or trampling may disrupt or injure an individual; however, overall, controlling invasive plants would result in beneficial effects to special status wildlife by restoring and maintaining native plant populations that provide habitat to these species. Thus, the NPS concludes that implementing the Selected Alternative may affect, but is not likely to adversely affect listed species. Similarly, the Selected Alternative is not likely to jeopardize continued existence of species proposed for listing. Mitigation measures included in the Selected Alternative to avoid adverse effects to special status species and their habitats are listed in the Mitigation Measures Table (below).

## **Designated Wilderness**

The invasive plant management actions proposed under the Selected Alternative are necessary to protect Wilderness character. These actions meet the minimum requirements for management actions conducted in Wilderness (see Appendix K, Minimum Requirements Analysis). The use of manual, cultural and herbicide control methods could result in local, negligible adverse impact to Wilderness character. Early detection and prevention actions would have a long-term moderate beneficial impact on Wilderness character, because these actions would help prevent the invasion of non-native species into areas largely free of invasive plants. Overall, actions taken under the Selected Alternative to protect Wilderness from invasive species effective invasive species would result in long-term, parkwide moderate beneficial impacts to wilderness character.

## **Archeological Resources**

Some treatments for controlling invasive plants such as tilling and digging plants up by their roots result in ground disturbance. Ground disturbance has the potential to damage or expose archeological resources. The park will mitigate the potential for adverse effects to archeological resources from ground disturbance in accordance with procedures in the Yosemite Programmatic Agreement (NPS 1999). Where potential impacts could take place as the result of ground disturbing activities, the park archaeologist and the American Indian Liaison would be consulted prior to beginning work. In some cases, the protection of archeological resources could preclude the use of some control techniques. The use of herbicides in areas where ground disturbance is not permitted will allow those invasive plant populations to be controlled. Overall, the prevention and control activities proposed under the Selected Alternative would not result in adverse effects to archaeological resources.

## **Traditional Cultural Properties and Ethnographic Resources**

Two locations in the Yosemite Valley are managed as traditional cultural properties and plant populations that are culturally significant to associated American Indians based on their traditional uses exist throughout Yosemite National Park. These would not be impacted by actions taken to control invasive plants under the Selected Alternative. Ethnographic resources such as traditionally used plant populations can be displaced by the continued spread of invasive plants, and could benefit from their removal. The purpose of actions proposed under these alternatives is to protect park natural and cultural resources from damage resulting from the introduction and spread of non-native invasive plants. Management in traditional gathering areas will consider all available treatment options. The park would avoid or minimize direct impacts on traditional cultural properties through meaningful and ongoing information sharing, consultation and collaboration between park subject matter specialists, resource managers and traditionally associated American Indian tribes and groups. Where it is collaboratively determined that the use



of herbicides is necessary to control species that threaten cultural resources and do not respond to physical control, measures would be taken to protect the health of those who gather cultural use plants prior to beginning treatment. These include posting signage that documents when and where herbicides were applied and when cultural use plants may again be safely gathered; the use of the safest herbicides available; spot spraying of herbicides only to target species; and when possible, applying herbicides at times of year when plants are not gathered. Planning and mitigation discussions would also involve collaboration to determine appropriate times, methods, and locations for various treatments. Management actions have short-term minor adverse impacts on the ability to gather traditional use plants. Management actions could be scheduled over several years so that management activities would take place in only a small portion of habitat for any particular traditional use plant, thus allowing for gathering of the resource. Impacts related to invasive plant control activities would be minimized in accordance with the 1999 Programmatic Agreement such that there would be no adverse effects on traditional cultural properties.

## **Cultural Landscape**

The invasive plant management program under the Selected Alternative could reduce the spread of existing invasive plants that have the potential to alter the cultural landscape. Control methods could have a temporary impact on the cultural landscape directly after work crews remove invasive plants. Impacts related to invasive plant control activities would be minimized through best management practices (see Table 1, Mitigation Measures) and in accordance with the 1999 Programmatic Agreement such that there would be no adverse effects on the cultural landscape.

## **Visitor Experience and Recreation**

Control activities under the Selected Alternative could have a short-term minor adverse impact on the visitor experience for some visitors and a short-term minor positive impact for other visitors, depending upon their reaction to meeting park personnel in wilderness and their views on herbicide use. Overall, there will be a long-term minor beneficial impact on the visitor experience because this alternative will prevent invasive plants from continuing to adversely affect the character of the scenic landscape, altering the character of the scenic landscape, limiting access to natural areas in the park, and limiting the visibility of scenic historic views.

## **Park Operations**

Implementation of the Selected Alternative could result in short-term minor adverse impacts on park operations resulting from increased staffing needs for prevention, early detection, control, monitoring, and outreach and education about invasive plants. With the use of herbicides, high-priority invasive plant populations will be eradicated in less time than without the use of herbicides. Invasive plant management efforts will result in a short-term minor adverse impact and a long-term minor beneficial impact on park operations.

## **Cumulative Impacts**

The Council on Environmental Quality describes a cumulative impact as follows:

*... "Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or*

*non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

No significant cumulative impacts were identified for any of the impact topics analyzed in the *2010 IPMP Update EA*. In some cases, past regional impacts have been adverse, long term, and major. This is true in the case of the following impact topics: soils, hydrology and water quality, wetlands, vegetation, special-status plants, air quality, noise, scenic resources, and park operations. Present and foreseeable future actions could contribute to reversing some of the local adverse impacts of past actions, and could produce long-term minor to moderate benefits.

### **Non-impairment of Park Resources**

Pursuant to the 1916 Organic Act, the NPS has a management responsibility "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of future generations." Therefore, the NPS cannot take an action that will "impair" park resources or values.

Based on the analysis provided in the *2010 IPMP Update EA* (as updated with corrections noted in the errata, and mitigations herein), the NPS concludes that implementation of the Selected Alternative –*Alternative 2: Add Four Herbicides and Address Limitations in 2008 IPMP* will have no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Yosemite National Park; (2) key to the natural or cultural integrity of Yosemite National Park or to opportunities for enjoyment of the park; or (3) identified as a goal in the park's General Management Plan or other relevant NPS planning documents. Consequently, implementation of the Selected Alternative will not violate the 1916 Organic Act.

### **Wild and Scenic Rivers Act, Section 7 Determination**

Pursuant to the Wild and Scenic Rivers Act, the NPS must develop a Section 7 determination for any proposed water resource projects that may affect the beds and banks of Wild and Scenic Rivers that is the Tuolumne or Merced Rivers in Yosemite National Park. This determination ensures that actions do not affect free flow, and do not directly and adversely impact the ORV for which the rivers were designated. A water resources project is any dam, water conduit, powerhouse, transmission line, or other works project under the Federal Power Act, or other developments, that would affect the free-flowing character of a wild and scenic river. In addition to projects licensed by the Federal Energy Regulatory Commission, water resources projects may include dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction, reconstruction projects, bank stabilization projects, channelization projects, levee construction, boat ramps, and fishing piers. It also includes activities that require a Section 404 permit from the U.S. Army Corps of Engineers (IWSRCC 1999). Because the proposed action does not qualify as a water resource project as defined above, the NPS concludes that a formal Section 7 determination is not applicable. The NPS anticipates that there will be no effects to the beds and banks of the Wild and Scenic Rivers, or to their free flow; nor will it directly or adversely affect the ORV for which the rivers were designated.

## **Wetlands Statement of Findings**

The actions taken under the Selected Alternative of the *2010 IPMP Update EA* will be in compliance with Executive Order 11990 (Protection of Wetlands) and NPS Director's Order 77-1 and Procedural Manual 77-1: Wetland Protection. The purpose of invasive plant management actions are to protect and restore park natural and cultural resources, including wetlands, wetland hydrology, and wetland plants and wildlife. Manual, mechanical, cultural and herbicide treatment actions may result in negligible to minor, short-term impacts to soils, water quality, flora and fauna adjacent to treated invasive plant populations, see Chapter III, Affected Environment/Environmental Consequences. These actions are necessary for implementing restoration and protecting and restoring wetlands, and the potential short term impacts outweigh the potential negative impacts to wetland soils, plants and wildlife of not treating invasive species, or using ineffective means to control invasive species, that could be long-term to permanent, minor to major, and parkwide to beyond park boundaries. The proposed actions are short term disturbances directly associated with wetland restoration and have no major adverse impacts to hydrology or fauna; therefore, it is not necessary to prepare a Wetlands Statement of Findings.

## **Minimum Requirements Analysis**

Invasive species are a threat to natural and cultural wilderness resources. Herbicides are often the most effective and efficient tool for controlling many invasive species, particularly rhizomatous perennials. Herbicides **may be** determined to be the minimum tool, as discussed under each of the alternatives considered here. Herbicide use shall only be used in Wilderness when it meets the conditions of the Wilderness MRA.

The MRA has been completed for the Selected Alternative, Alternative 2, and is included in this FONSI. If necessary, for any species not addressed in Appendix A in the MRA, the control method would be selected following the protocol in Figure II-2 (Tool Selection Protocol), the decision would be documented, and the method described in the annual work plan. Additional MRAs (for actions that might fall outside the parameters analyzed in the programmatic MRA) would be conducted during future work planning, as appropriate, and will be posted with the annual work plans at:

<http://www.nps.gov/yose/naturescience/invasive-plant-management.htm>

## **Best Management Practices and Mitigation Measures**

The Mitigation Measures table (below) has been incorporated into the Selected Alternative to protect and avoid or reduce impacts to natural and cultural resources, and protect the quality of the visitor experience. Best Management Practices and Mitigation Measures are described in Chapter II: Alternatives, Chapter III: Affected Environment/Environmental Consequences, Appendix D: Best Management Practices to Prevent the Spread of Invasive Plants, Appendix F: Herbicide Use and Storage Protocol, and Appendix H: Mitigation Measures Common to All Alternatives.

## Mitigation Measures

## NATURAL RESOURCES- Wildlife and Plants - Sensitive Species and Habitats

*During Planning Phase:*

- The **invasive plant program manager** (program manager) will work with the **park's botanists** and **tribal liaison** to determine whether park special-status plant species (including cultural use plants) are present in the area. If special-status species occur in the proximity of invasive plant control activities, the park shall develop site-specific mitigations to ensure no adverse effects to special-status plant species. If federally protected plant species are discovered in proposed work areas, the U.S. Fish and Wildlife Service will be consulted, and no control activities will take place until that consultation is complete. Currently, no federally listed plants are documented in the park.
- The **program manager** will coordinate with the **park's wildlife biologists** to determine if there are any locations of concern for protecting special status species or their habitats (e.g., California red-legged frog or Western pond turtle, Sierra Nevada yellow-legged frog, and Yosemite toad, great gray owls and other park wildlife species of concern). As necessary, the program manager will work with the wildlife biologists to schedule wildlife surveys directly prior to any mechanical control of vegetation or the application of herbicides in areas of concern, such as suitable or occupied habitat. If special status wildlife species are known to occur, or are found at the proposed treatment sites, the wildlife biologist will advise the program manager of appropriate site-specific mitigation measures, such as buffers and/or timing of treatments to implement to protect these species.
- The program manager will ensure that crews will not apply herbicides within 100' of blue elderberry plants between March 1 and June 30 (adult flight stage) to protect federally- threatened valley elderberry longhorn beetles that are active during this period. No broadcast spraying will occur within 30 feet of blue elderberry plants; but hand application methods (cut and dab) may be used within 30' of the drip line, outside of flight times (USFWS, 2010, 2011). This strategy has been developed to protect active beetles while allowing for management of invasive species that could otherwise displace elderberry plants. [REDACTED] Any new stipulations which the USFWS may impose to protect this or other listed species will be documented in the annual work plan and incorporated by reference into the 2010 IPMP Update EA.

*During Control Phase:*

- **Crews** will not apply herbicides in standing water.
- Where necessary, **restoration ecologists** will revegetate or reseed treatment areas with native species after invasive plant control activities.
- If weed control efforts leave areas devoid of vegetation, the **program manager** will direct **crews** to implement erosion control methods as needed.
- Prior to leaving weed control areas, **work crews** shall inspect boots, clothing, and equipment, and shall remove any seeds, dirt, mud, or other debris that might contain invasive plant seeds or propagules.
- **Crews** will keep all equipment clean and free of mud, dirt, vegetative debris, or other materials that could contribute to the spread of weeds in the park.
- **Crews** shall properly dispose of viable seeds and plant materials to prevent the spread of noxious weeds.
- Should pack stock be required to support invasive plant prevention or control activities, **wranglers** will feed stock only certified weed-free feed.

## Mitigation Measures

## CULTURAL RESOURCES

*During planning phase:*

- The **program managers** will consult with **park cultural resource specialists** and **park-associated American Indian tribes and groups** in order to avoid adverse effects on traditional cultural properties, archeological resources, and other culturally significant resources.
- The **program manager** will consult with the **park archeologists** and the **park American Indian liaison** and together review proposed treatments to develop mitigation strategies that ensure no adverse effects to archeological and ethnographic resources.
- The **program manager** will consult with the **park cultural anthropologist, American Indian liaison, and associated American Indian tribes and groups** to ensure no adverse effects to traditional cultural properties or ethnographic resources.
- The **program managers** will use the annual work plan, meetings and other methods to consult with the **park cultural anthropologist, American Indian liaison, and associated American Indian tribes and groups** during the planning phase to ensure that control activities will not adversely affect traditional cultural properties or practices, or endanger the health of those who gather cultural use plants.

*During Control Phase:*

- **Crews** will not conduct ground-disturbing activities on identified archeological sites without prior approval from the **park archeologist**, and certification of No Adverse Effect to archeological resources. A professionally qualified archeological monitor will be present when recommended by the park archeologist.
- The **program manager** will consult with the **park cultural landscape architect** to ensure no adverse effects to historic cultural landscapes.
- The **program manager** will incorporate the protection of cultural resources in annual training programs for invasive plant crews.
- [REDACTED]
- Where it is collaboratively determined that the use of herbicides is necessary to control species that threaten cultural resources and do not respond to physical control, **crews** will ensure that measures would be taken to protect the health of those who gather cultural use plants prior to beginning treatment. These include posting signage that documents when and where herbicides were applied and when cultural use plants may again be safely gathered; use of the safest herbicides available; spot spraying of herbicides only to target species; and when possible, applying herbicides at times of year when plants are not typically gathered, and staggering control efforts to ensure that resource gathering opportunities still exist each season.

## WILD AND SCENIC RIVERS

*During Planning and Control Phases:*

- The **program manager** and **crews** will ensure that Invasive plant management activities will not negatively impact water quality or the free flow of Wild and Scenic Rivers; nor will it directly or adversely affect the **Outstandingly Remarkable Values** for which the rivers were designated.

## WILDERNESS

*During Planning and Control Phases:*

- The **program manager** and **crews** will ensure that herbicide use shall meet the conditions of the Wilderness Minimum Requirements Analyses (MRAs) for the Invasive Plant Management Plan, which will be posted on PEPC and the Invasive Plant Program webpage.

*During Control Phase:*

- **Crews** will follow "Leave No Trace" camping and work protocols.
- **Crews** will be limited to legal group size limits (15 in trailed areas, 8 in off-trail areas).
- **Crews** will minimize the need for pack-stock support.
- **Crews** will follow the Herbicide Use Protocol in the 2010 IPMP Update EA.

## Mitigation Measures

## VISITOR AND EMPLOYEE SAFETY

*During Planning Phase:*

- The **National Park Service** shall work with **residents, parents, and other interested parties** to develop the most appropriate solutions for high-priority invasive plant control on playing fields or playgrounds on National Park Service lands and the El Portal Administrative Site. Invasive plant control efforts shall not take place without prior notification of local residents.
- On Mariposa County and Mariposa Unified School District land assignments and leases, and other land assignments in Yosemite National Park, the **National Park Service** shall work with **agencies and partners** to achieve integrated pest management goals.

*During Control Phase:*

- The **National Park Service** shall provide all necessary Personal Protection Equipment, except footwear, to **park employees, Interns, and volunteers**. Depending on the task, this equipment includes (but is not limited to) hard hats, gloves, eye protection, snake gaiters, Kevlar chaps, hearing protection, mesh face shields, and reflective vests.
- Prior to project implementation and continuing throughout, the **program manager** will ensure that **crews** receive safety training, including (but not limited to) dangerous plants and animals, heat-related health issues, fall protection, hazmat protection (for gas and oil associated with power tools), working around heavy equipment, traffic safety, defensive driving, and first-aid/Cardio-vascular Resuscitation.
- Prior to project implementation and during control activities, the **program manager** shall develop and follow an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan to address hazardous materials storage, spill prevention, and response. **Crews** will review the requirements of the plan with appropriate park staff, such as dispatch, rangers and appropriate state and federal agencies, on an annual basis. **Crews** shall be familiar with, maintain, and carry spill response kits.
- **Crews** shall maintain and carry first-aid supplies for hazmat exposure accidents.
- **Crews** shall carry spill response materials, including absorbent pads and other materials to contain hazardous material spills, into the field.
- **Crews** shall inspect all equipment for leaks on a daily basis.
- **Crews** shall use absorbent pads when refueling equipment (including hand-held equipment) and shall not refuel equipment in wetland areas or in the River Protection Overlay. Fuel containers brought into the field shall be stored on absorbent pads, on level ground, and away from working power equipment.
- When working on road shoulders, **crews** shall wear appropriate PPE (e.g., reflective vests or jackets) and shall use appropriate signage or traffic control to ensure the safety of workers and visitors.
- When working in construction areas, **crews** shall wear appropriate PPE (e.g., hard hats, eye and hearing protection) and shall obey site control rules (such as sign in and out) as defined by the entity (National Park Service or contractor) that controls the construction site.
- **Volunteers** shall not operate power tools or motorized equipment.
- **Work crews** will notify the **park Safety Office** in the event of a hazardous materials spill. All spills shall be documented.
- **Volunteers** shall not operate power tools or motorized equipment.

## Mitigation Measures

**HERBICIDE USE***During Planning Phase:*

- The **program manager** shall develop an herbicide use, storage, and safety plan for each treatment area to ensure the safety of workers and visitors, as well as to prevent soil and/or water contamination. The plan shall include sequence of treatment, dates, times, locations, herbicide trade names, U.S. EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient, and equipment used for application. The plan shall also include information on herbicide transportation and storage, as well as herbicide safety.
- The **program manager** shall develop annual work plans that identify timing and locations of planned herbicide use. Herbicide treatment shall not take place outside of identified locations. Information shall be made available to the public via the Yosemite National park website and other print media, prior to herbicide application.
- The **program manager** shall ensure that all use of herbicides with a U.S. EPA registration number must be approved by the **National Park Service Pesticide Use Proposal System** and **designated integrated pest management coordinator**. Annual pesticide use logs shall be filled out in the National Park Service approval system.

*During Control Phase:*

- **Crews** will follow the Herbicide Use and Storage Protocol for the Invasive Plant Management Plan.
- **Crews** shall ensure that herbicide application methods, equipment, and rates shall be selected to minimize the potential for drift and off-target impacts while meeting invasive species management objectives.

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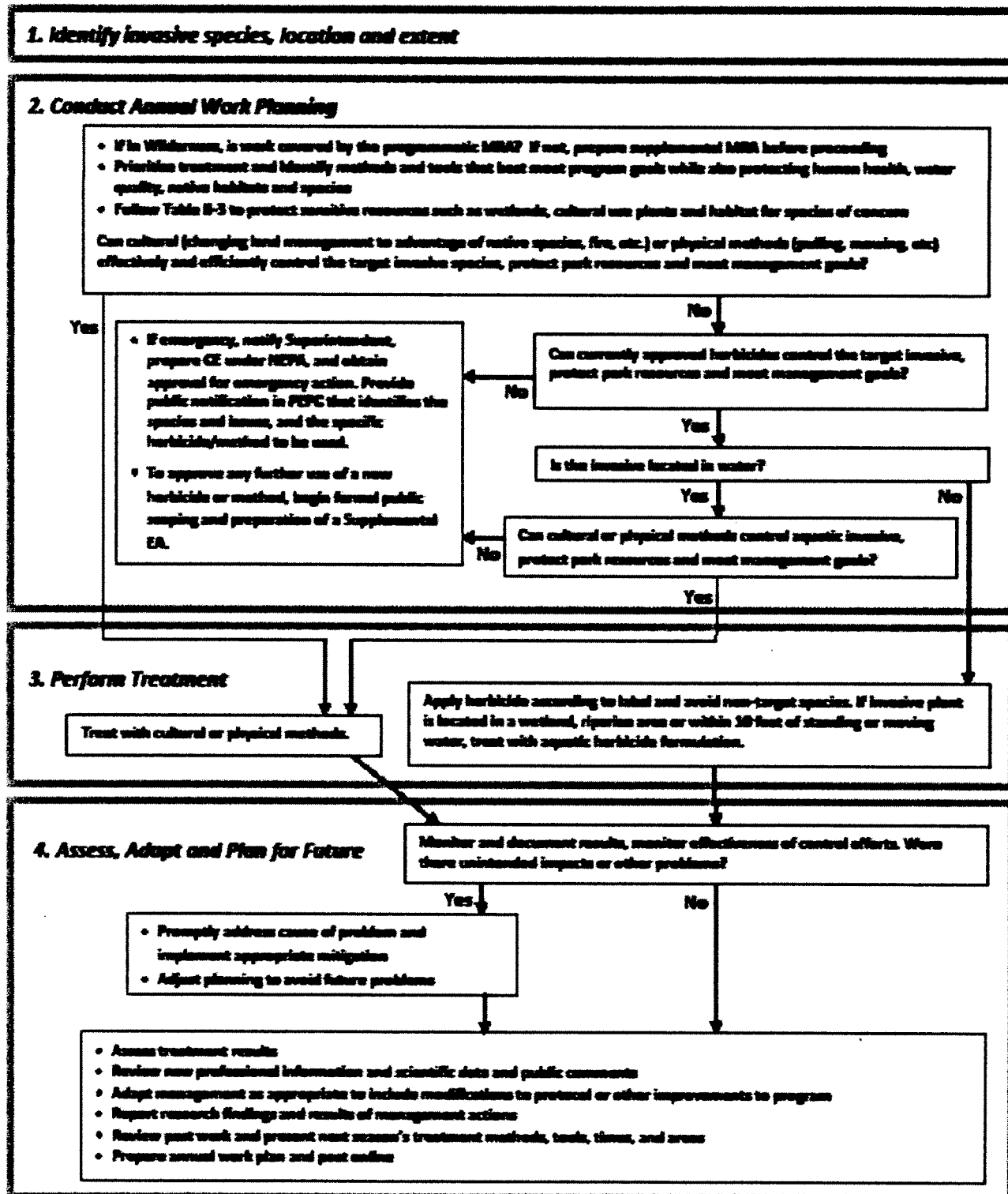


Figure B-2. Invasive Plant Management Tool Selection Protocol

## Public Involvement

### Scoping

A formal public scoping period was held for the *2010 IPMP Update EA* from April 14 through May 15, 2010. The park announced the opening of public scoping with a press release and announcement in the *Yosemite National Park Daily Report* and in the *Mariposa Gazette* (newspaper of record), as well as electronically through the Yosemite National Park website, and the NPS's Planning Environment and Public Comment (PEPC) database system. The park invited interested parties to attend two public meetings (open houses) and an interpretive site visit during the public scoping period. Professional staff members were available at the open houses to introduce the project, answer questions, and accept comments. Open houses continued monthly from the initiation of the scoping period through the conclusion of the planning process. The open houses included exhibits about existing conditions, the proposed plan and alternatives, methods and techniques, and environmental considerations. Public comments were accepted at open houses, by mail, by e-mail, and through PEPC.

During the 30-day scoping period, five public comment letters were received. These comments were thoroughly reviewed and analyzed to identify substantive concerns, and each distinct comment was summarized in a public scoping report. These comments were considered by the project team during the development of alternatives for this EA. In addition, the planning team reviewed public comments received on the *2008 IPMP EA* (published in the 2008 FONSI and available in PEPC) for relevancy and applicability to the new environmental assessment.

### Public Comment on the Environmental Assessment

Availability of the *2010 IPMP Update EA* for public review, with a comment period from December 15, 2010- January 30, 2011, was announced in the *Mariposa Gazette* (paper of record) with a press release, and a notice in the *Yosemite National Park Daily Report*, and the Yosemite National Park website. During this period, the NPS held a public meeting during the open house, specific to the *2010 IPMP Update EA*, and also provided information at the regularly scheduled open houses to disseminate information and collect informal written comments on the EA. The park received 26 comment letters from individuals, agencies, tribes, and organizations including: Sierra Club Yosemite Committee, the Mariposa County Agricultural Commissioner, Central Sierra Environmental Resource Center, Defenders of Wildlife, Sierra Forest Legacy, Tehipite Chapter, American Rivers, and Californians for Alternatives to Toxics.

Park staff carefully reviewed and analyzed the comments to identify substantive concerns, and prepared a management briefing report for management review and consideration of the public concerns and suggestions. A Public Comment Response Report will be included and published with the FONSI, and posted on PEPC. All public comment letters have been uploaded and are available to the public on the park website:

[www.nps.gov/yose/parkmgmt/invasive\\_docs.htm](http://www.nps.gov/yose/parkmgmt/invasive_docs.htm)

The main issues and concerns raised by the public included:

- General safety and use of herbicides,
- Concerns regarding addition of new herbicides,
- Request that options to herbicides be considered,
- Objections to the “*Preferred Alternative*” (Alternative 3, *Adaptive Management*),
- Concerns about the use of herbicides in and near water,
- Concerns about potential impacts to sensitive resources and human health,
- Concerns for health and safety of those who gather cultural use plants,
- The desire for an opportunity for a NEPA public review and comment process for addition of new herbicides,
- Concerns about methods in Wilderness, and recommendations to use minimum tool concepts.

None of the comments received introduced substantive new information, nor raised issues not fully considered in the *2010 IPMP Update EA* and in the refinement of Alternative 2, the *Selected Alternative*, as stated herein. Modifications to the proposed alternative made in response to public comments have been described above; and the changes, clarifications, and corrections made to Alternative 2 are noted in the Errata Sheets prepared as a technical supplement to the EA.

## Consultation and Coordination

In the development and review of the 2010 IPMP Update EA, the NPS contacted and consulted other agencies, associated tribes and groups, and interested parties including the U.S. Fish and Wildlife Service, the U. S. Forest Service, and the California State Historic Preservation Office, according to NEPA, NHPA, and NPS policies and directives.

### U.S. Fish and Wildlife Service

Yosemite National Park is within the jurisdiction of the Sacramento Fish and Wildlife Office, and consults with this office regarding federally listed candidate, threatened, or endangered species with potential to occur in the project area and that might be affected by the project. The park generated a Species List from the USFWS website on September 14, 2010. The park used the list (last updated by USFWS in April, 2010) and used park staff's professional knowledge and park data to refine the list and determine which species might be affected by the project, for each alternative, and developed mitigations for the alternatives to avoid impacts to these species and their habitats. The NPS concluded that the Selected Alternative may affect, but is not likely to adversely affect federally-listed species, and it will not jeopardize continued existence of proposed species, nor will it affect critical habitat. The NPS transmitted a copy of the *2010 IPMP Update EA* with these conclusions to the Sacramento Office, with a request for review and concurrence with our determination.

NPS contacted the USFWS specifically to review the mitigations for elderberry longhorn beetle (personal communication, J. Karuzas, USFWS, June 23, 2010, July 28, 2011). The mitigations were refined based on their recommendations, as noted in the Mitigation Measures Table (above).

On July 21, 2011, NPS contacted the USFWS regarding clarification of mitigations for California red-legged frogs (personal communication, J. Karuzas, USFWS). Conferencing is ongoing regarding appropriate buffers for this and other special status amphibian species. The NPS will follow the mitigation listed in Table II to protect this species and its habitat, pending further direction from the agency. Any new stipulations which the agency may impose to protect this or other listed species are incorporated by reference as conditions of this decision.

## **Culturally Associated American Indian Tribes and Groups**

The project scope includes areas with known traditional cultural properties and other culturally significant ethnographic resources to which American Indians attach religious and cultural significance. Yosemite National Park is consulting with American Indian tribes and groups that have a cultural association with Yosemite National Park—including the American Indian Council of Mariposa County (also known as Southern Sierra Miwuk Nation), the Tuolumne Band of Me-Wuk Indians, the North Fork Rancheria of Mono Indians, the Picayune Rancheria of Chukchansi Indians, the Bishop Paiute Tribe, the Bridgeport Paiute Indian Colony, and the Mono Lake Kutzadika<sup>a</sup> Paiute Tribe—to ensure no adverse effects on traditional cultural properties or other ethnographic resources. Yosemite National Park staff presented the project at on a 22 June 2010 North Fork Rancheria of Mono Indians of California and at a September 22, 2010 tribal meeting with the Tuolumne Band of Me-Wuk. The park's American Indian Liaison also discussed the plan at various meetings with associated tribes and groups. The park received two comment letters from the Chairperson for the North Fork Rancheria of Mono Indians and one from the Cultural Coordinator for the Tuolumne Me-W Wuk Tribal Council. Their concerns include:

- NPS should not use herbicides in traditional gathering areas. Tribes have requested alternatives to herbicides in culturally significant areas.
- NPS should [continue to] consult with tribes about invasive species management in traditional use areas.
- NPS should continue with [the methods] you all are using in certain places depending on the invasiveness of the type of weeds you all are dealing with. NPS should use cut and dab control techniques [in areas of special concern, such as near springs or] around horsetail and raspberry plants.
- NPS should consider alternative treatment methods in traditional gathering areas.
- NPS should acknowledge the need to do actual outreach with elders from the Seven Tribes regarding selective exclusion of plants used for making baskets, medicines, and food, from plant management practices.
- An NPS archeologist should be consulted during any activity that would result in "ground-disturbing activities and tribes should be notified prior to any such disturbance so they can have a cultural monitor from our tribe on site, if they feel it is necessary.
- NPS should be aware that tribes are concerned that residues can remain on plants that have been sprayed with herbicides. These herbicide residues could have dire health effects on our tribal citizens.

- NPS should use the most effective techniques to protect park natural and cultural resources that also have the least possible impact upon humans and the environment; specifically the people who gather traditional use plants.

These comments and concerns have been taken into consideration in the refinement of the Selected Alternative and mitigations. Consultation and information sharing with American Indian tribes and groups regarding invasive plant management is ongoing.

### **California State Historic Preservation Officer/Advisory Council on Historic Preservation**

In accordance with the 1999 PA, professional staff from Yosemite National Park have determined that implementation of the Selected Alternative will have "no effect" on archeological properties and "no adverse effect" on traditional cultural properties, historic sites, structures, and landscapes (36 CFR 800.5). Thus, consultation with the California State Historic Preservation Officer and the Advisory Council on Historic Preservation is not required per Stipulation VII.C.2 of the 1999 PA.

### **Non-impairment of Park Resources**

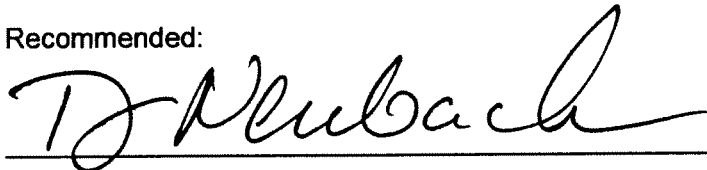
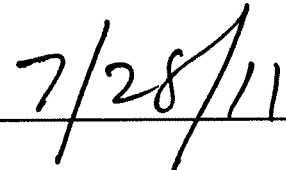
The 1916 Organic Act created the NPS and gave it the responsibility to "conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of future generations." Therefore, the NPS cannot take an action that will "impair" park resource or values. Based upon the analysis provided in the 2010 IPMP Update EA, and as described above, the NPS concludes that implementation of the Selected Alternative, *Alternative 2: Add Four Herbicides and Address Limitations*, will have no major adverse impacts on a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Yosemite National Park; 2) key to the natural or cultural integrity of Yosemite National Park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan or other relevant NPS planning documents. Consequently, implementation of the Selected Alternative will not violate the 1916 Organic Act.

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## Conclusion

Based on information contained in the *2010 IPMP Update EA* (as summarized above and with corrections noted in the Errata); the review of comments received from affected agencies and the public; and the incorporation of the mitigation measures to avoid or reduce potential direct, indirect, and cumulative impacts, it is the determination of the National Park Service that the Selected Alternative is not a major federal action that will significantly affect the quality of the human environment. There will be no unacceptable impact or impairment of park resources or values as a result of the Selected Action. Therefore, in accordance with National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9), an Environmental Impact Statement will not be prepared. The Selected Alternative as documented above and detailed in the *Invasive Plant Management Plan Update EA* may be implemented as soon as practicable.

Recommended:

   
\_\_\_\_\_  
Don L. Neubacher  
Superintendent, Yosemite National Park

Date

Approved:

   
\_\_\_\_\_  
Christine S. Lehnertz  
Director, Pacific West Region, National Park Service

Date

# Invasive Plant Management in Designated Wilderness in Yosemite National Park

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## Step 1: Determine if administrative action is necessary.

Description: Briefly describe the situation that may prompt action.

The purpose of this *programmatic minimum requirement Analysis* (PMRA) is to:

- assess the potential impacts of a program for an *Integrated Pest Management* (IPM)-based invasive plant management program upon the character of wilderness in Yosemite National Park,
- determine the minimum requirements for such a program.

The purpose of non-native invasive plant (NNIS) management in Yosemite is to protect the park's natural and cultural resources from damage or displacement by non-native species. IPM is the paradigm used by the NPS to guide invasive species management planning. It includes inventory, prioritization, prevention, treatment (including cultural, restoration, fire, manual and mechanical, chemical or other management techniques to encourage native species over non-natives), monitoring and outreach and education. Because of the vast area of Yosemite's wilderness and the limited resources available for control, this program will focus on prevention, early detection and effective eradication. This focus will maximize the benefit to wilderness character by protecting the natural quality of the Yosemite Wilderness while minimizing manipulation of natural processes.

Wilderness areas are often the last refugia for native plant communities and their dependent wildlife. NNIS can cause fundamental and irrevocable change to these iconic, natural landscapes (Temple, Cilimburg and Wright 2004). Changes can include altered fire regimes and the degradation or even complete displacement of native plant communities and the wildlife that depends upon these plant communities. NNIS have already permanently displaced much of the native vegetation across the Great Basin and Great Central Valley just east and west of Yosemite National Park, in the foothill woodland ecozone on the park's west side, and in low and mid-elevation meadows. While Yosemite's montane, subalpine and alpine plant communities are still predominately comprised of native species, the number of NNIS infestations in the park, including Wilderness areas, is growing. Recent studies have shown that even high-elevation wilderness areas such as those found in Yosemite National Park are not immune from invasion (Pauchard et al. 2009). Some such as spotted knapweed and rush skeleton weed have spread quickly even in undisturbed lands at high elevations.

Efforts to manage NNIS manually have been ongoing in the park since at least the 1930s. Herbicides, mostly 2-4,D, were used in the park from the late 1940s until the late 1960s. Herbicides were reintroduced as a management tool under the 2008 Invasive Plant Management Plan Environmental Assessment (2008 Plan). Implementation of a park Invasive Plant Management Plan has resulted in more programmatic, systematic and successful management and a better understanding of the scope of the NNIS problem. The primary changes include consistent leadership, systematic NNIS mapping, control and monitoring, and the preparation of an annual work plan, comprehensive crew training, posted online for public review, which analyzes the success of the past season's management actions and describes in detail actions proposed for the following season.

The 2008 Plan was updated in 2010 (2010 Update) to better stop the spread of invasive species by adding four additional herbicides, allowing herbicide use near water, removing minimum size and density

treatment restrictions, and making other changes. The affected environment and environmental consequences of actions taken to control NNIS were described and analyzed in great detail in both the 2008 Plan and 2010 Update. A description of the park's invasive plant management program and links to the 2010 Update and annual work plans can be accessed here:

<http://www.nps.gov/yose/naturescience/invasive-plant-management>.

The intent of this programmatic MRA is to determine the minimum requirement under IPM for protecting wilderness character from NNIS. In line with this intent, most actions carried out by the Park's invasive plant management program in designated Wilderness would involve prevention, early detection and effective eradication. A programmatic MRA is needed for several reasons:

- 95% of the park's 761,266 acres is in designated or proposed wilderness,
- the serious and dynamic nature of the threat posed by NNIS,
- the limited resources available for control, and
- the need to preserve the various aspects of wilderness character necessitates that these control actions occur while populations are still small, and that these actions are regularly recurring, efficient and effective.

**Urgency: Is the situation an emergency?**

Control of NNIS infestations is not an emergency as explicitly defined by the Wilderness Act because it is not normally an "emergency involving the health and safety of persons within the area." However, some new infestations and the rapid spread of some existing infestations can be considered an ecological emergency that threatens the natural character of wilderness, and has serious and long-term consequences if the emergency is not effectively mitigated. About ten new exotic plant species are found in the park each year and serious new threats in the lands surrounding the park including perennial pepperweed, reed canary grass, rush skeleton weed, spotted knapweed and other species. These species have the potential to cause widespread damage and even permanent displacement of park natural and cultural resources in designated Wilderness. The cost of control grows exponentially with increasing infestation size and once infestations reach a certain size, control may no longer be possible. The best protection of the wilderness resources is afforded by early detection and effective eradication of newly emerging and existing threats.

**To determine if administrative action is necessary, answer the following questions:**

**A. Describe Options Outside of Wilderness**

Is action necessary within wilderness?

Yes: ☒ No: ☐ Not Applicable: ☐

**Explain:** NNIS prevention, containment and control activities outside the wilderness are important and ongoing. NPS currently cooperates with a variety of federal and state agencies and landowners and other stakeholders in these efforts. However, actions taken outside of wilderness are insufficient for protecting wilderness character and natural and cultural resources from impairment resulting from the spread of NNIS populations already in wilderness, or from protecting wilderness resources from the introduction of new NNIS populations.



**B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation**

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes: ☐ No: ☒ Not Applicable: ☐

**Explain:** No valid existing rights or special provisions in The Wilderness Act (1964) specifically allow the consideration of any of the Section 4c prohibited uses for controlling NNIS. The following sections form the basis for analyzing such uses.

Section 2 (a) Wilderness "shall be administered ... in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas [and] the preservation of their wilderness character..."

Section 2 (c) An area of wilderness is...an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable..."

Section 4 (c) Prohibition of certain uses

"...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

Herbicides, because they are a powerful tool, are considered by some to be similar to the use of motorized equipment in wilderness. However, the use of herbicides is not specifically prohibited under Section 4(c).

**C. Describe Requirements of Other Legislation or Guidance**

Is action necessary to meet the requirements of other laws? Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies?

Yes: ☒ No: ☐ Not Applicable: ☐

**Explain:** The legislation and guidance for managing invasive species on NPS lands designated as Wilderness can be conflicting. However, the main goal of each of these laws, such as the founding legislation for the National Park Service mentioned above, is the protection of natural and cultural resources.

The *National Park Service Management Policies* (NPS 2006b), the agencies primary policy document, states that: "Exotic species will not be allowed to displace native species if displacement can be prevented" and "In general, new exotic species will not be introduced into parks." Also according to NPS Management Policies 6.3.5, Minimum Requirement, all management decisions affecting wilderness must be consistent with a minimum requirement concept. "When determining minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resource or character is unavoidable, only those actions that preserve wilderness character and/or have local, short-term adverse impacts will be acceptable."

Executive Order 13112 (1998) prevents the introduction and spread of invasive species. This federal directive provides overarching guidance for the management of invasive species, and requires federal agencies to act upon: leadership and coordination, prevention, early detection and rapid response, control, education, research, and restoration. Executive Order 13112 established the National Invasive Species Council to provide national leadership and ensure that "federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective." Executive Order 13112 also called for the preparation of the *National Invasive Species Management Plan* (NISC 2001). The updated *2008-2012 National Invasive Species Management Plan* was distributed for public comment from December 28, 2007 through February 11, 2008 (NISC 2008). The park's *2008 Plan* and this *2010 Update* follow guidance provided by the National Park Service Director's Order 77-7: *Integrated Pest Management*. The Executive Order of February 3, 1999 titled *Invasive Species* requires federal agencies to detect NNIS and respond quickly to infestations.

Yosemite National Park's Resources Management Plan (NPS 1999) directs specific activities for the management of natural and cultural resources throughout the park. In 2000, the *Natural Resource Challenge Exotic Action Plan* created a funding roadmap to improve the NPS's response to harmful plant species. In 2006, the NPS finalized the *Invasive Species Action Plan*, building on the *Natural Resource Challenge Exotic Action Plan*, further addressing the categories required under Executive Order 13112 and the *National Invasive Species Management Plan*. The action alternatives in this plan are consistent with park-wide and service-wide legislation and policy.

Section 15, of the Federal Noxious weed act of 1974 (PL 93-629) directs the management of undesirable plants on federal lands. The Carson-Foley Act of 1968 directs federal agencies to allow state officials to enter public lands to control noxious plants. Legislation and policy specific to Yosemite National Park include the enabling legislation for Yosemite National Park, the California Wilderness Act of 1984, and the *General Management Plan* (1980) for Yosemite, which provides overall management direction for Yosemite National Park. As required under the Federal Insecticide, Fungicide, and Rodenticide Act of 1978, and also Department of Interior policy, "*Federal agencies shall use Integrated Pest Management techniques in carrying out pest management activities*" (FIFRA, 7 U.S.C. 136r-1, Department of Interior Manual, Sec.517). The Plant Protection Act (2000) authorizes the United States Department of Agriculture to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, or plant pest.

The *2010 Update* meets the *1980 General Management Plan* management objectives for resource management (NPS 1980). These objectives include:

- restore and maintain natural terrestrial, aquatic, and atmospheric ecosystems so they may operate essentially unimpaired;
- conduct continuing research analysis to attain information necessary for managing natural resources;
- restore altered ecosystems as nearly as possible to conditions they would be in today had natural ecological processes not been disturbed;
- protect threatened and endangered plant and animal species, and reintroduce, where practical, those species eliminated from the natural ecosystems;
- identify and perpetuate natural processes in park ecosystems;
- limit unnatural sources of air, noise, visual, and water pollution to the greatest degree possible;
- support an integrated system of compatible regional land uses providing opportunities for recreation, community development, preservation, and economic utilization of resources;
- participate with government agencies and private interests in planning for compatible management and use of scenic, natural, cultural, and recreation resources.

Federal agencies are required by law to "use Integrated Pest Management techniques in carrying out pest management activities and shall promote Integrated Pest Management through procurement and regulatory policies" (7 U.S.C. §136r-1). The park must abide by federal regulations for herbicide use. Applicable legislation includes the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. §136 et seq.) and the Occupational Safety and Health Administration's (OSHA's) Hazard Communication Standard (15 U.S.C. 2601 et seq.). Under the Federal Insecticide, Fungicide, and Rodenticide Act, the U.S. Environmental Protection Agency (EPA) must evaluate

herbicides for potential adverse effects on the environment. Herbicides must be tested for safety and registered with the Office of Pesticide Programs. Under OSHA standards, employers must provide workers with training, protective equipment, and information about hazardous substances. In addition, NPS *Management Policies* (NPS 2006b) requires that all park service pesticide application be supervised by individuals licensed under the procedures of a federal or state certification system.

#### D. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

**Untrammeled:** Yes: ☐ No: ☒ Not Applicable: ☐

**Explain:** Trammeling is the intentional manipulation of natural processes. Any action to treat NNIS would be a trammeling of wilderness because it represents human control and manipulation of natural processes. Actions taken to detect NNIS populations while they are still small and eradicate them using tools and methods that are effective can greatly reduce the extent, intensity, and number of future management actions. Clearly, the earlier NNIS threats are analyzed and mitigated, the less manipulation of natural processes take place in the long run.

**Undeveloped:** Yes: ☐ No: ☒ Not Applicable: ☐

**Explain:** No structures, motorized equipment or mechanical transport are proposed.

**Natural:** Yes: ☒ No: ☐ Not Applicable: ☐

**Explain:** Action is necessary to protect the natural quality of wilderness character from damage or displacement by NNIS. NNIS, left untreated, can spread rapidly and impair park natural resources by altering fundamental ecological processes such as plant community dynamics and disturbance processes such as fire. The loss of native plant communities can result in a cascade of other changes, including the impairment or even the loss of wildlife dependent upon specific native plant species and natural habitats. Whether any action is taken or not, the natural conditions of wilderness are threatened. The spread of noxious weeds in the wilderness area is partly caused or enhanced by human actions (seed introduction, spread along trails and in campsites, etc.). To allow it to continue spreading would be a direct sign of unintentional human influence.

**Outstanding opportunities for solitude or a primitive and unconfined type of recreation:**

Yes: ☒ No: ☐ Not Applicable: ☐

**Explain:** The wilderness recreation experience is in part dependent on the wilderness setting representing a natural and native ecosystem. If NNIS are allowed to spread and eventually replace native vegetation the human experience in wilderness will be affected. The effects include changes in vegetation type and also habitat for wildlife species that depend on the natural conditions. NNIS can also directly affect the recreation experience when the invasive species are spiny, sticky or poisonous, or consolidate into impenetrable thickets.

**Other unique components that reflect the character of this wilderness:**

Yes: ☐ No: ☐ Not Applicable: ☒

**Explain:** None identified for this area.

## Step 1 Decision: Is any administrative action necessary in

Yes: ☒ No: ☐ More Information needed: ☐

**Explain:** Without control, new NNIS will continue to be introduced and existing infestations will continue to spread with the result that they will continue to degrade and displace native plant communities and the wildlife that depend upon intact native plant communities. When NNIS infestations are not effectively controlled while they are small, they can expand to the point where control is no longer feasible, as Eurasian annual grasses have in the lower elevations of Yosemite National Park. The result in the Sierra Nevada foothills has been a permanent conversion of vegetation type. This would be a significant degradation of both the natural quality of wilderness character, and the experiential quality, as visitors would no longer be able to enjoy natural vegetation and wildlife. To prevent these anthropogenic changes and impacts to wilderness character, administrative action is necessary.

**To determine if administrative action should be a Programmatic Minimum Requirements Analysis, answer the following questions:**

**A. Will the proposed actions be routine, recurring administrative activities in Wilderness?**

Is action necessary within wilderness?

Yes: ☒ No: ☐

**Explain:** Because of vectors such as roads, trails, streams, wildlife and wind, NNIS propagules are continually introduced and spread throughout the park. Treatment actions and locations can vary but the methods described in this PMRA must be routine and recurring if they are to be successful. NNIS Inventory, control and monitoring are three main components that will recur in Wilderness.

**B. Do the proposed actions involve possible Section 4 (c) exceptions, and/or have a potential to impact wilderness resources and values?**

Yes: ☐ No: ☒

**Explain:** Section 4 (c) states, "... there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...". While vehicles and motorized tools such as brush cutters are commonly used to control NNIS, the alternatives presented in this MRA do not propose the use of tools or construction of structures prohibited under Section 4(c). Should the need arise for motorized equipment (e.g. brush cutter) or mechanical transport to effectively treat NNIS to maintain Wilderness character, an additional project specific MRA would be developed.

We recognize that herbicides are powerful, sophisticated tools. Therefore, we propose using them in wilderness with due restraint, as articulated below.

## Step 2: Determine the minimum activity.

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

## Actions Common to all Alternatives

**Summary:** Components of IPM that are common to all of the alternatives are described here. IPM outlines a comprehensive management strategy comprised of inventory; prioritization; prevention; treatment; monitoring; and research and outreach and education. This holistic approach has been shown to be the most effective way of conducting an invasive plant management plan and is required under federal law and Department of Interior policy. Prioritization, prevention and outreach and education efforts do not generally occur in wilderness.

Because of the vast area of Yosemite's wilderness and the limited resources available for control, this program will focus on prevention, early detection and effective eradication. Species are prioritized for treatment using a modified version of the USGS Alien Plants Ranking System (USGS 2000). This system prioritizes species for control based upon the threat that they pose to park natural and cultural resources, the extent of park infestations and the likelihood of control. The prioritization of NNIS drives all program activities, from detection to treatment and monitoring, and hence, the program's influence on the Wilderness character. Species priority assignments are not entirely static and can change when new information becomes available. When for instance a new NNIS is detected, the overall program focus may change. If data becomes available that identifies an existing exotic species is more invasive than was previously known (e.g. velvet grass, dandelion), the ranking has to be upgraded.

**Prioritization:** NNIS are prioritized for control because funds and staff available for control are limited and the phenological treatment windows are often very narrow. Appendix A shows prioritization for high, medium-high, and medium priority species. A well defined list of Yosemite NNIS priorities creates consistency in the management efforts, and it provides for transparency. Control efforts in wilderness are tightly focused on medium and higher priority species which have the greatest potential to harm park resources and which are most likely to be controlled, see Appendix A of the 2010 Update.

**Inventory, Monitoring, and Early Detection:** Inventory, monitoring and early detection are both like and unlike management actions such as trail construction and maintenance. NNIS can invade and spread on their own.

## Alternative 1: Physical and Cultural Control Only

**Summary:** Under Alternative 1, the NPS would use only physical (hand pulling, shovel shearing, digging up NNIS by the roots) and cultural (altering resource management to discourage invasives; restoring native plant communities for example) control methods to control those NNIS for which physical and cultural control methods are effective. This action would protect park natural and cultural resources and wilderness character from those NNIS having a small infestation size and which respond to physical and cultural controls. The effects of Alternative 1 upon various aspects of wilderness character are compared below.

## Alternative 2: Physical, Cultural and Herbicide

**Summary:** Under Alternative 2, resource managers would use physical, cultural and herbicide control, methods to protect the natural and cultural resources in Yosemite's wilderness from NNIS. Control methods are selected based upon what is effective, reasonable and appropriate under NEPA and what is

the minimum required to preserve wilderness character under the Wilderness Act for controlling a particular species. For example, physical and cultural methods would be used for species such as common mullein for which these methods have been shown to be effective and herbicides would be used for species such as Himalayan blackberry for which physical controls have been shown to be ineffective. Herbicides would be applied as spot applications to NNIS individuals and patches, with the minimum amount of herbicide used necessary for control. The effects of Alternative 2 upon various aspects of wilderness character are compared below.

**Sideboards:** The staff of the park's invasive plant management program uses the most effective and appropriate tools and methods to protect park resources, including the various aspects of wilderness character, from NNIS. However, NPS also recognizes that some NNIS management methods are controversial. The aim of these sideboards is to help define the minimum requirement and limit the potential for unintended impacts resulting from NNIS management, while at the same time still allowing for effective and programmatic NNIS management.

- **Special Protection Zones:** Table II-3 from page II-10 of the 2010 Update shows where special considerations will be made prior to choosing the appropriate NNIS management method or tool. These include cultural resource areas, special status plant and wildlife habitat, wetlands and riparian areas, and others. Special considerations are also considered in great detail for 13 individual impact topics in the Affected Environment/Environmental Consequences chapter of the 2010 Update.
- **Control Categories:** While they are not explicitly addressed in the Wilderness Act, the use of herbicides is considered by some to be similar in impact to the use of power tools. Invasive species were assigned control categories to help ensure that the minimum requirements for protecting the natural quality of wilderness from NNIS. The categories are described in Table 1. These species were categorized using a modified version of the USGS Alien Plants Ranking System (USGS 2000), an analytical software tool. Plants were categorized based upon impact, threat and difficulty of control and grouped as low, medium or high priority. Appendix A from the 2010 Update has been amended and appended to this PMRA. A column has been added for medium-priority species and the most appropriate control methods have been listed for each species.

These categories will be periodically updated. This is because new species continually enter the park, and certain species, particularly annuals, can become more invasive over time. Or, certain species can become so widespread that fighting them park-wide is simply not possible. Such species would become a lower priority for control such as is happening with cheatgrass. Changes in species priority will be posted online in the Invasive Plant Management Program's annual work plan.

- **Infestation Size:** This MRA covers control of infestations that have less than ten canopy acres. Control of larger infestations would require an additional MRA, see discussion below.

**Table 1: Control Categories:**

Control Category	Description
A. <u>Medium High and High Priority Species</u> Use the most appropriate manual, cultural or herbicide treatment.	Plants are too small or plants have deep roots or rhizomes for effective manual or cultural control. Or, plants pose too great a threat to park resources and wilderness character to risk using a less effective means of control. Manual and cultural methods will still be used to control these species when and where appropriate.
B. <u>Medium Priority Species</u> That can be controlled using manual or cultural treatments.	Because of limited resources, many medium-priority species are not managed. Management goals will be met using manual or cultural methods only.
C. <u>Medium Priority Species</u> For which herbicide treatment can be necessary	Herbicide use can be necessary when management goals cannot be met for these species using manual or cultural control.
D. <u>Low Priority Species</u>	Plants do not pose a significant threat to park resources

Use most appropriate manual or cultural control treatment.	or wilderness character, and are generally not managed. Where control actions are initiated, only manual or cultural methods will be used.
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\*See Appendix A for list of medium, medium high and high priority species.

#### Sideboards Considered but Dismissed:

- **Distance from Wilderness Boundary, Roads and Trails:** Restrictions on which management method or tool to use based upon distance from the wilderness boundary and roads and trails were dismissed because the threat posed by NNIS is too grave to unnecessarily restrict the ability of resource managers to apply best professional judgment to decisions about how to manage a particular species. Such restrictions could unreasonably restrict the ability to manage NNIS where they are most likely to occur, where wilderness character is most likely to be already impacted by roads, visitors and other factors, and from which they are most likely to continue to spread into wilderness. Such restrictions away from the wilderness boundary would unnecessarily limit the ability of resource managers to protect the most pristine areas of the park.
- **Herbicide Volume Restrictions:** Herbicide volume restrictions were dismissed in favor of total infestation size, which is easier to apply in the field. However, the metric is actually derived from the total herbicide volume used for a given target species in the wilderness which field personnel are already required to track by State law. Application equipment is carefully calibrated, and field personnel can easily and accurately calculate the total area the treatment was applied to.
- **Patch Density Restrictions:** Patch density restrictions were dismissed because of the great uncertainty inherent in accurately gauging the relationship between patch density, infestation size, and likelihood of control for each individual species and management method or tool.

## Comparison of Effects of Actions Common to All and Two Alternatives:

#### Wilderness Character

**“Untrammelled”** – All impacts to the untrammelled quality are considered permanent. Inventory and monitoring would not impact the untrammelled quality as they do not involve any manipulation of natural processes. Physical, cultural and herbicide NNIS treatments would have a local, minor impact the untrammelled quality of wilderness because each of these methods represent human control and manipulation of the wilderness resource. The use of a less effective control method would result in additional trammeling when their use results in the need of additional manipulation to preserve the natural quality:

- they can result in more site visits over a greater period of time to preserve the natural quality of wilderness than would have been required had a more effective tool or method been used;
- can reduce the ability of resource managers to manage other priority NIS infestations while they are still of limited extent;
- can allow NNIS to become widespread and cause permanent damage to natural systems;
- can expose park resources to unacceptable levels of risk.

**“Undeveloped”** – There is no effect on the undeveloped quality of wilderness character because there is no use of motorized equipment, construction of structures, or placement of signs.

**“Natural”** – The introduction and spread of NNIS into wilderness areas can result in the degradation or displacement of native plant species and the wildlife that depend upon these species. Regardless of whether they are surveying for NNIS or performing manual or herbicide control, the presence of NNIS control workers in wilderness could result in minor, temporary and local trampling of vegetation and disturbance of wildlife. The introduction of synthetic herbicides into natural systems can result in a minor, temporary and negative impact to the natural quality. There is a risk of unintended consequences when using herbicides. This risk has been analyzed in detail in the 2010 Update. However, herbicides can also protect the natural quality of wilderness from species such as Himalayan blackberry and velvet grass, species for which physical and cultural control methods are not effective. If ineffective methods were used for these species, the negative impacts to the park’s natural and cultural resources would be similar to

taking no action to protect the park's natural resources from NNIS. Effective NNIS control would enhance the natural quality by reducing the negative impact of these non-native species on all components of the wilderness resource and providing habitat for reestablishment by native species.

**“Outstanding opportunities for solitude or a primitive and unconfined type of recreation” –**

The presence of inventory, monitoring and treatment crews could result in a minor and temporary adverse affect to the wilderness experience of those park visitors they encounter. Encountering staff who are actively working to protect wilderness from degradation by invasives could improve the visitor experience for some people. Encountering staff spraying herbicides in wilderness could have a negative impact on the visitor experience for others. The spread of species that are that not effectively controlled by physical or cultural methods could result in long term and wide spread impacts to opportunities for primitive recreation because visitors would not be able to experience natural environments with a full complement of native species. The need for repeated site visits over many years that is made necessary by the use of a less effective management tool could result in greater negative impacts to opportunities for solitude than an alternative that allows herbicides. In the long term, the use of more effective control methods and the protection and restoration of native plant communities will serve to enhance the wilderness recreation experience.

**Heritage and Cultural Resources:** NNIS such as Himalayan blackberry and velvet grass and many other species threaten the integrity of native plant communities that include cultural use species, see further analysis in 2010 Update, the Invasive Plant Program's Invasive Plant Management Web page and Annual Work Plan at: <http://www.nps.gov/yose/naturescience/invasive-plant-management>. Physical, cultural and herbicide control efforts can result in local, temporary minor and negligible impacts to these resources. Some tribal members oppose the use of herbicides for control NNIS that grow among or near cultural use plant populations. There are concerns for the health of those who gather cultural use plants, and some think that the use of herbicides is not appropriate in certain culturally important areas. Conversely, while heritage and cultural resources would be protected from species such as common mullein using physical control, very intensive physical management efforts repeated over many years would be necessary to keep species such as Himalayan blackberry and velvet grass from degrading displacing the habitats which currently contain cultural use plants. The disruption to the ability for those who gather cultural use plants would be local and short term where these areas are closed to gathering following herbicide control actions. However, the disruption of the ability to gather these plants would be permanent should invasive species be allowed to displace these species. Disruptions could be mitigated through consultation and cooperative management efforts, or by only treating a portion of any particular gathering area in any particular year, and sometimes by using alternate techniques.

**Special Provisions:** None

**Safety of Visitors, Personnel, and Contractors:** The risk to crews from travelling over rugged terrain and working with stock, and manual, cultural and herbicide control methods are similar to that of other management actions in wilderness. When properly used, the risks of herbicides to the safety of park visitors, personnel and contractors is minimal, see Appendix G in the 2010 Update. On steep slopes and in remote areas, herbicides would pose a lesser risk to workers than sharp mechanical or hand tools. Risks from the use of herbicides can be minimized by using the safest herbicide that is effective for controlling a particular target species. Any risks to visitors can be minimized by making the areas and times of treatment known. The thorns of species such as Himalayan blackberry can injure park visitors and staff. Effective treatment can limit exposure to thorns. More effective methods such as herbicide use could protect park staff, visitors, grazing stock and wildlife from the thorns and awns of species such as yellow star-thistle, Himalayan blackberry and medusa head.

**Economic and Time Constraints:** Prevention, early detection and effective eradication are the best methods to protect wilderness character from NNIS. The time and money needed to control a population rises exponentially as that population is allowed to spread, and the probability the population is controlled declines dramatically, see Figure 1. Using a less efficient or effective control method or tool could result in higher costs in terms of time, money, the need for repeated follow up control efforts, the need for additional personnel and other resources, and the increased probability of failure for control efforts.

Efforts have been made to quantify the economic value of conserving intact ecosystems and the services they provide. Almost four million visitors have come to Yosemite each year in recent years. The waterfalls and granite cliffs would still be here even if NNIS were allowed to spread. However it is appropriate to



consider larger economic questions. If NNIS are allowed to continue to displace native wildflowers and plant communities, with the resulting displacement the bears and other wildlife that depend upon intact native plant communities, would the park receive as many visitors? Could this then have an economic impact upon concessionaires and the communities surrounding the park?

**Additional Wilderness-specific Comparison Criteria:** None identified.

**Cumulative Impacts:** The predominant impacts related to most NNIS management actions in Wilderness such as inventory, monitoring and manual control are similar to those from trail maintenance, firefighting, search and rescue, visitor management and other park actions taken in Wilderness. Staff will traverse, work and camp in wilderness, which could result in minor, short-term, negligible and minor negative trampling, trampling of native vegetation, disturbance of wildlife, and disruption of visitor solitude. Even wilderness areas are impacted by the atmospheric deposition of pollutants. The application of small amounts of the herbicides described in the 2010 Update will not add significantly to those impacts.

## Step 2 Decision: What is the Minimum Activity?

Alternative #2 meets the minimum requirements for NNIS management in designated wilderness. The program will focus on prevention, early detection and effective eradication. Most prevention, outreach and education efforts would take place outside of designated Wilderness. Manual, cultural and herbicide methods and tools would be used, as appropriate for each particular NNIS. Non-mechanical transport will be used to move herbicide, people and supplies to treatment areas. Although surveying for, controlling and monitoring NNIS populations could result in negligible to minor, temporary and local negative impacts to some aspects of wilderness character, any negative impacts would be outweighed by the long term, widespread and moderate to major benefits of preserving the natural aspect of wilderness character; the culturally significant plants and other native plant communities and their dependent wildlife, and the opportunity for visitors to experience and scientists to study intact native plant communities. While any management action to control NNIS is an impact to the untrammelled quality of wilderness character; these impacts are outweighed by the potential for much greater impacts to the natural quality. Herbicides are powerful tools that have a small risk of unintended consequences, but those risks are outweighed by the impacts to natural conditions and processes that would occur if ineffective methods result in the expansion of NNIS or less effective methods result in repeated visits and treatments to remove a given species.

**\*This space is left intentionally blank\***

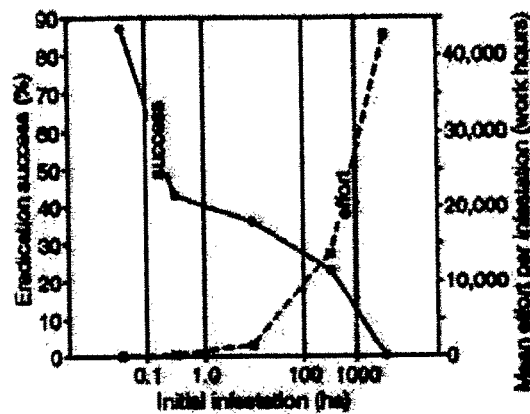


Figure 1: As infestation size increases, effort to control, measured in hours (and dollars) increases, while success of eradication decreases.

**Rationale for selecting this alternative:** The management of NNIS in natural systems is complex and invasive species management is a continuously developing science. In line with philosophy that underlies the Wilderness Act, resource managers must have the humility and restraint to understand when to act, and what level of action is appropriate. This is complicated by the facts that the resources are not available to control all species and infestations, and also some species are already too widespread to be realistically controlled. Regardless of what method is used to control a particular NNIS, prevention, early detection and effective eradication are essential. Figure 1 above shows that as an infestation increases in size, the level of effort measured in hours and dollars increases dramatically and the likelihood of successful control decreases (Rozenfelds et al 1999, Rejmanek and Pitcairn 2002, NISC 2008). In order to comply with the minimum requirements of the Wilderness Act, it is also important that infestations be found and controlled early before infestations spread and extensive, repeated and potentially high impact long-term management is required.

NNIS can differ from other natural resource challenges because some of these species can spread rapidly and can displace native plants and wildlife if control efforts are not promptly undertaken or effective. Some have deep taproots or rhizomes (underground stems). Some can produce thousands of seeds which can persist and germinate year after year for many years, even decades. A number of studies (Smith et al. 1999, Timmins and Braithwaite 2001) and Figure 1 show that using an effective early control NNIS can result in far smaller impacts to wilderness character over time than less effective control methods. Less effective methods often lead to the spread of NNIS due to:

- limited resources available for repeated or intensive control efforts,
- competing demands on crew time during narrow phenologic treatment windows,
- logistical difficulties in the wilderness

In order to be successful in the control of NNIS, the pace of the management success must be greater than the rate of spread of the target species. Because of the time lag in detecting new infestations, NNIS can quickly get the upper hand. Figure 2 shows the mapped canopy cover of Himalayan blackberry in Cathedral Meadow in the Yosemite Valley after just one herbicide treatment in 2009. The use of herbicides resulted in 96% control. Staff and volunteers had previously spent an estimated 100,000 hours, unsuccessfully attempting to control this one species using physical methods. In spite of a tremendous effort, its rate of spread far outpaced the rate of control. Management needs for other species are discussed in greater detail in the 2010 Update, in the annual work plan, and on the park's invasive species website at <http://www.nps.gov/yose/naturescience/invasive-plant-management>.

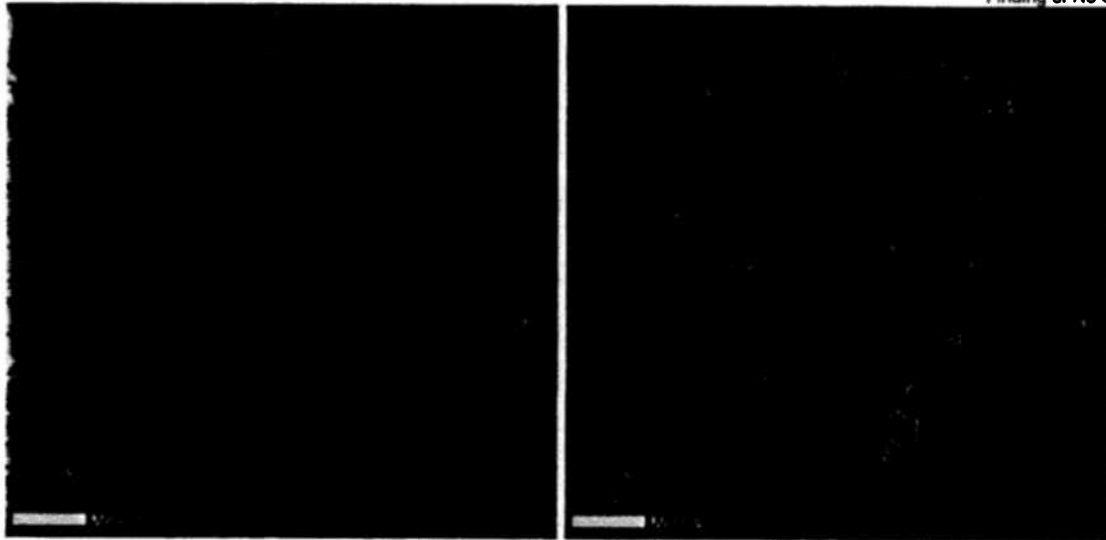


Figure 2: A large, 9.65 acre infestation of Himalayan blackberry in Cathedral meadow was reduced to 0.34 acres in 2010, after a single herbicide treatment in fall of 2009.

A programmatic approach is necessary because:

- Over 200 exotic plant species are already established in the park;
- many new species continue to enter the park, at least 10 each year in the last three years;
- more than 8000 infestations have been documented. Because more infestations are found with each survey effort, this represents only a portion of actual park infestations;
- vast areas of the park remain completely unsurveyed, including most wilderness areas within the park;
- serious threats are approaching park boundaries;
- IPM resources are acutely limited.

The impacts and benefits of various treatment tools and methods were described and assessed in the 2010 Update. Each of the control methods considered under the selected alternative is appropriate as the minimum tool, depending upon the species. Physical methods such as hand-pulling, shovel shearing and digging up of plants by their roots are effective treatments for some species, provided treatments are repeated often enough and for a sufficient number of years to control the infestation. Herbicide treatment is necessary for other species. There is a risk in beginning a course of management action which requires conscientiously repeating treatments multiple times over many years. Controlling infestations early, while infestations are still small, would result in less herbicide being applied in wilderness and smaller impacts to wilderness character than if these infestations were allowed to spread.

Herbicides, while a powerful tool, are not explicitly prohibited under Section 4 (c) of the act. Were they prohibited, an exception for the use of herbicides would be similar to exceptions which allow for structures or the use of motorized tools "...as necessary to meet minimum requirements for the administration of the area for the purpose of this Act". There is a risk of unintended consequences in using herbicides. However, based upon analysis conducted for the 2010 Update, the use of herbicides would be a compromise because it would protect the natural quality of wilderness character but would have local, negligible to minor impact upon the untrammelled quality of wilderness character. The control categories, which rank NNIS depending upon their impact, threat or difficulty of control, are an additional safeguard. They show that the minimum tool will be used as appropriate to control particular NNIS. From Section 4(c), "If a compromise of wilderness resource or character is unavoidable, only those actions that preserve wilderness character and/or have local, short-term adverse impacts will be acceptable." The benefits to the natural quality of Wilderness character of treating NNIS outweigh the negative impacts of individual treatment actions.

**Rationale for not selecting the other alternatives:** Alternative 1 would not protect park natural and cultural resources or the natural quality of wilderness or opportunities for primitive recreation in wilderness from species such as yellow star-thistle which cannot effectively managed using only manual and cultural control methods. If NNIS which are not effectively controlled using manual and cultural control methods were allowed to spread, this would violate the *NPS Management Policies* (NPS 2006b) which states that "Exotic species will not be allowed to displace native species *if displacement can be prevented*". It would also violate Sections 2(a) of the Wilderness Act which states that wilderness "shall be administered ... in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas [and] the preservation of their wilderness character...", and Section 2(c) which defines wilderness as "an area...retaining its primitive character and influence... which is protected and managed so as to preserve its natural conditions and which...generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable"...

**Actions Considered but Dismissed:** The following alternatives were considered but dismissed because impact to Wilderness character was too large without possibility of mitigation or because the method would not effectively treat the problem to maintain Wilderness character.

1) No Control of NNIS: This action was dismissed because allowing for the continued spread of NNIS which would result in impairment of the park's natural and cultural resources. Allowing impairment would violate the 1916 Organic Act and the other laws and regulations described above. Not all invasive species can be controlled. No known treatment methods are effective for park-wide control of some widespread species such as cheatgrass and wild oats. There is insufficient scientific documentation of the effectiveness of NNIS treatment across areas of such a large extent as Yosemite. Also, the resources available to control NNIS are limited, so not all species can be controlled. But, resource managers and members of the public across the world recognize the value of intact natural habitats so control actions will occur.

2) Use of Mechanical and motorized equipment: Mechanical methods were dismissed because other effective methods, having less impact to Wilderness character, are available. Loud machinery and the smell of fuel and exhaust can degrade the visitor experience and disturb wildlife, and mechanical cutting tools can be dangerous for workers, especially in remote areas and on rough ground. Should the need arise for such tools, additional NEPA compliance and a new MRA would be developed.

3) Use of Domestic Herbivores: Grazing animals are not selective and can impact non-target species. They can also trample soils, impair water quality and degrade visitor wilderness experience. Because equally effective control options are available, this option was dismissed.

4) Use of additional Biological Controls: Biocontrol agents can be effective for some species and several bio-controls were released into the park in the past (see 2010 Update). No NNIS currently found in wilderness require the further release of biological control agents to meet management objectives. Should the need arise, an additional MRA and additional NEPA compliance would be developed.

5) The Use of Herbicides in Water to Control Aquatic NNIS: This alternative was rejected because of public concerns regarding potential non-target impacts resulting from applying herbicides in water. Aquatic invasive species infestations have not yet been found in Yosemite National Park, although several species are present in streams and reservoirs just outside of the park. Should the need arise, additional NEPA compliance and an additional MRA would be developed.

6) **Aerial Spraying:** Aerial spraying of herbicides was eliminated from consideration because the extent of current wilderness infestations which would respond to such an action do not justify the impact to the undeveloped character or non-target impacts of overspray to native plants and other resources and species. Should the need arise, additional NEPA compliance and an additional MRA would be developed.

7) **Prescribed Burning:** The park does have a prescribed fire program and prescribed fire can benefit ecosystems, reduce fuel loads and benefit native species over invasives.

Prescribed burning expressly to control NNIS was eliminated because, while most western ecosystems evolved with periodic fire, fire can also allow for the establishment and spread of species such as cheatgrass. Should the need arise, additional NEPA compliance and an additional MRA would be developed.

**The following actions or situations would trigger a new MRA:**

**1) Control of Populations over 10 Canopy Acres:** Because known populations of most priority NNIS in wilderness, other than some Eurasian annual grasses are still small, the emphasis upon this MRA is prevention, early detection and effective eradication. Should there be a need to control more than 10 canopy acres of a particular priority species population in any one year, the appropriateness of control actions in wilderness and minimum tool would be assessed in a new MRA. Because control efforts are ongoing for these priority species, **Himalayan blackberry, velvet grass, and bull thistle** are exceptions to this acreage limit. The canopy acres will be calculated for each species, in and outside the wilderness boundary after each season and included in the annual summary which is posted with the annual work plan, usually in mid-December.

**2) Additional Herbicides:** Should an emergency situation arise and application of a new herbicide be considered necessary to control a species that cannot be reasonably controlled using currently approved herbicides, control would occur under an emergency CE approved by the park superintendent with treatment limited to known populations of a specific species. Should this herbicide be considered necessary for programmatic use, public notice would be given and a concurrent NEPA compliance process would be initiated. The supplemental EA would include an analysis of potential environmental impacts and a public review period.

**3) Signs:** The use of signs in wilderness would require a new MRA.

**Check any Wilderness Act Section 4(c) uses approved in this alternative:**

- |                                               |                                                    |
|-----------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> mechanical transport | <input type="checkbox"/> landing of aircraft       |
| <input type="checkbox"/> motorized equipment  | <input type="checkbox"/> temporary road            |
| <input type="checkbox"/> motor vehicles       | <input type="checkbox"/> structure or installation |
| <input type="checkbox"/> motorboats           |                                                    |

None of the above-listed 4(c) uses

Submitted By:

Charles E. Payne 7/14/11  
Project Manager Date

Reviewed By:

[Signature] 7-14-11  
Division Chief, RMS Date  
(Attach any comments and conditions)

[Signature] 7/18/11  
Wilderness Manager Date  
(Attach any comments and conditions)

[Signature] 7/20/11  
Chief Ranger Date  
(Attach any comments and conditions)

Approved By:

[Signature] 7/20/11  
Superintendent Date

# Errata Sheets

August 2011

This section itemizes clarifications, corrections, and changes made to the Invasive Plant Management Plan Update EA following publication in December 2010, and public review. These errata should be maintained with all copies of the Invasive Plant Management Plan Update EA for a complete record of the completed environmental impact analysis. The changes and corrections incorporate responses to public, agency, and internal review comments received on the plan and additional National Park Service staff analysis. Revised or new language is underlined. Deleted text is marked by strikethrough.

Where a change is made as part of a response to a public comment, the concern identification number is noted in brackets at the end of the text change, see the *Invasive Plant Management Plan Update EA Public Comment and Response Report* (NPS 2011).

## Abstract

Page v: The following sentences have been added to the end of the paragraph on Alternative 2, second paragraph from bottom:

...in Wilderness (special protections for sensitive areas still apply, see Table II-3 Special Protection Zones). Four additional herbicides are proposed for use.

Page v: The following text has been changed:

Park crews would use two approved herbicides to control up to 22 invasive plant species...

## Contents

Page vii: The title of Alternative 2 has been corrected:

Alternative 2: Adding Four Herbicides and Addressing Limitations of Existing Plan

Page ix: The following Appendix title has been changed:

Appendix F: Herbicide Use, Safety and Storage Protocol

## Overview of the Alternatives

Page xi: The following text has been changed:

Park crews would use ~~one of the~~ two approved herbicides...

## Chapter I. Purpose and Need

Page I-2: Under **Need** heading, the following paragraph has been deleted:

~~With this 2010 Update, as more effective herbicides are developed, tested, and approved for use on public lands in the western states, adaptive management protocols would allow the park to select herbicides that have greater efficacy and/or fewer undesirable effects than those currently used. Park staff would work cooperatively with university researchers and other experts to find the safest, most efficient, and most effective tools to protect Yosemite's biodiversity. The effectiveness of integrated pest management treatment actions would be monitored.~~

Page I-6: Goal 5 – Monitoring, the following bullet is added to the list of goals:

- Monitor and evaluate methods and applications for unintended/undesirable effects to non-target species and take corrective actions if necessary.

## Chapter II. Alternatives

Page II-2: The following header has been added immediately under the header "**Actions Common to All Alternatives**".

### **Integrated Pest Management**

Page II-8: The third bullet under the header "**Best Management Practices**" has been changed:

- Use only herbicides approved by NPS, and U.S. and California Environmental Protection Agencies. Follow all state and federal regulations pertaining to herbicide handling, application, and storage.

Page II-10, the paragraph titled Minimum Tool has been replaced.

~~**Minimum Tool.** The minimum tool would be used in Designated Wilderness. Invasive species are a threat to natural and cultural wilderness resources. Herbicides are the most effective and efficient tool for controlling many invasive species, particularly rhizomatous perennials. Herbicides are a minimum tool under each of the alternatives considered here. Work crews will follow all herbicide safety, storage, transportation, and use protocols outlined in this plan. Herbicide use shall meet the conditions of the Wilderness Minimum Tool Requirements Analysis, see Appendix J.~~

### **Minimum Requirements Analysis**

Invasive species are a threat to natural and cultural wilderness resources. Herbicides are often the most effective and efficient tool for controlling many invasive species, particularly rhizomatous perennials. Herbicides may be determined to be the minimum tool, as discussed under each of the alternatives considered here. Herbicide use shall only be used in Wilderness when it meets the conditions of the Wilderness MRA.

The MRA has been completed for the Selected Alternative, Alternative 2, and is included in this FONSI. If necessary, for any species not addressed in Appendix A in the MRA, the control method would be selected following the protocol in Figure II-2 (Tool Selection Protocol), the decision would be



documented, and the method described in the annual work plan. Additional MRAs (for actions that might fall outside the parameters analyzed in the programmatic MRA) would be conducted during future work planning, as appropriate, and will be posted with the annual work plans at: <http://www.nps.gov/yose/naturescience/invasive-plant-management.htm>

Page II-10: Table II-3, **Special Protection Zones**. The "Wetlands, Riparian Areas, and Wild and Scenic River Corridors" row has been modified; the last sentence has been modified

...treatment could include herbicide application in water. Should treatment in water be necessary the Superintendent would be notified and a NEPA process would be immediately initiated. [28210]

Page II-10: Table II-3, Special Protection Zones. The row "Designated Wilderness" has been modified:

- ~~A minimum tool analysis-~~ minimum requirements analysis would be conducted...

Page II-11: The header **Monitoring** has been changed to **Monitoring and Reporting**

Page II-11: The following language has been changed:

~~Trend M~~monitoring includes the following:

Page II-11: The title of Alternative 2 has been changed:

Alternative 2: Adding ~~Four~~ Herbicides and Addressing Limitations of Existing Plan

Page II-11: The following paragraphs have been added as regular text below the **Corrective actions monitoring** bullet:

Annual work plans are developed and posted on the park's Invasive Plant Management Program webpage before each field season at: <http://www.nps.gov/yose/naturescience/invasive-plant-management.htm>.

These plans are sent to the tribes and groups associated with Yosemite National Park as part of consultation, and are posted online for review by the general public. Managers review the professional and scientific literature, review the results of park studies and the previous season's treatment actions, and consult with staff and other specialists in order to select the most appropriate treatment methods and mitigations. Tribes and the public are notified of the proposed treatment schedule, locations, methods and tools.

Page II-15: The following sentence has been changed in the 2nd paragraph under the header "Treatment":

Imazapyr, like glyphosate, is effective on a wide variety of species and can be used ~~in aquatic situations~~ near water. [28210]

Page II-16: Language has been changed and a sentence has been inserted in the second paragraph under the header "No Spraying of Herbicides in Traditional Gathering Areas":

...Ongoing information sharing and consultations with culturally associated tribes and groups will be an integral component of the process for determining the most

appropriate control method in these areas. Management in tribal gathering areas will consider all treatment options. The most appropriate method...

Page II-16: The following language has been changed:

**Ten-foot Setback from Standing or Moving Water.** Alternative 2 differs from Alternative 1 in that aquatic herbicide formulations ~~would~~ can be used within 10 feet of the waterline. Herbicides will not be applied in water. [28210]

Page II-17: The following sentence would be removed. This has already been stated on page II-2 in the ***Actions Common to All Alternatives*** section:

~~As is required by federal law (7USC136r-1) for actions conducted by federal agencies, Alternative 3 would also be based upon the principles of integrated pest management.~~

Page II-17: The paragraphs beginning with “Finally, Alternative 3 includes adaptive management...” and ending with “The Council on Environmental Quality also recognizes the value of incorporating the adaptive management model into the NEPA process (CEQ 1997).” will be moved to the **Actions Common to All Alternatives** section at the bottom of page II-9.

Page II-17 (moved per previous paragraph to page II-9), the following paragraph has been changed.

~~Finally, Alternative 3 includes Management planning for each of the alternatives includes adaptive management, a process that This process promotes flexible decision making to allow for program adjustments in the face of uncertainties and ecosystem variability (Williams, Szaro, and Shapiro 2007; Prato 2006). Adaptive management builds upon traditional NEPA implementation processes because it includes monitoring and adaptive measures as part of the NEPA analysis. Using adaptive management, the invasive plant management program could be constantly improved by using the results of monitoring and new information to respond proactively to changing conditions with improved and innovative techniques as appropriate. Alternatives 1 and 2 are tacitly adaptive in that workers and managers generally strive to increase effectiveness and efficiency. However, the processes for justifying, assessing, and documenting flexible management responses are detailed in Alternative 3. The adaptive management protocol is not open ended. Allowable actions are limited to those described in the three alternatives.~~

Page II-19, the sidebar titled “**Steps involved in adaptive management of invasive plants include:**” will be moved to page II-10, following the adaptive management section.

### **Chapter III. Affected Environment/Environmental Consequences**

#### **Special Status Vegetation**

Page III-37, second paragraph under Affected Environment header:

An additional 146 special status plants found within park boundaries are designated ~~Park S-sensitive~~ sensitive by Yosemite National Park botanists.

Page III-37, insert the following text box after second paragraph under Affected Environment header:

**Special Status plants in Yosemite meet one or more of the following criteria:**

- Federally listed (USFWS) threatened or endangered species
- California listed rare or endangered species
- U.S. Forest Service Sensitive or Watch List species
- Listed in the California Native Plant Society Inventory of Rare and Endangered Plants
- Sierra Nevada endemic species
- Species with a limited distribution in Yosemite and/or California

Page III-41, last paragraph under Cumulative Impacts header:

Past impacts on special status plants have been adverse, long-term and major. Present and foreseeable future actions would contribute to reversing ~~the major~~ some of the past adverse impacts of past actions on special status plants, and would produce long-term minor beneficial effects on special status plants. Among other benefits, Yosemite could provide a refuge from which plants could recolonize their former ranges. ~~These past, present, and future effects, along with the local long-term minor beneficial impacts of all the no-action and action alternatives, would result in long-term adverse minor impacts on vegetation.~~

## **Wildlife**

Page III-45, last sentence in paragraph under Cumulative Impacts header:

~~The past, present, and future effects, along with the local long-term minor adverse impacts of these alternatives, would result in long-term moderate adverse impacts on wildlife.~~

## **Special Status Wildlife**

Page III-52, last sentence in last paragraph under Cumulative Impacts header:

~~The past, present, and future effects, along with impacts of all three alternatives would result in long-term adverse moderate impacts on special status wildlife.~~

## **Traditional Cultural Properties and Ethnographic Resources**

Page III-63, top of third paragraph under Environmental Consequences header:

Planning and mitigation discussions would also involve collaboration to determine appropriate times, methods, and locations for various treatments. Management in tribal gathering areas will consider all available treatment options.

Page III-63, Conclusion paragraph:

Non-native invasive species pose a significant threat to cultural use plants in Yosemite National Park. Management in tribal gathering areas will consider all available treatment options.

## Chapter V.

Page V- 1, first paragraph, the following sentence has been removed:

~~The park received comment letters during the public scoping process, including 29 from individuals and 17 from organizations.~~

## Appendices

### Appendix F: Herbicide Use and Storage Protocol

Page F-4, bottom of **Reporting** section:

- Data and results of monitoring are reported annually, and can be viewed online at: <http://www.nps.gov/yose/naturescience/invasive-plant-management.htm>

Page F-4, **Reporting** section, the following language has been changed:

- ~~Herbicide spills greater than 1 ounce undiluted aminopyralid or 1 gallon diluted aminopyralid, or 32 ounces undiluted aquatic glyphosate or 1 gallon diluted aquatic glyphosate, would immediately be reported to the park safety officer and the county agricultural commissioner.~~
- Herbicide spills greater than 1/4 dry ounce undiluted chlorsulfuron, 1 fluid ounce undiluted aminopyralid, rimsulfuron or triclopyr, 32 fluid ounces undiluted glyphosate, or any diluted amount greater than 5 gallons, or the amount of diluted herbicide needed to treat 1 acre, would be reported to the park safety officer.

Page F-4, bottom, new section following **Reporting** section:

#### **Water Quality Protection:**

- Although the park is proposing to use aquatic formulations of imazapyr and glyphosate, the park will nonetheless not deliberately apply herbicide in water, despite that fact that the label for such formulations allows the product to be applied in such a manner.

### Appendix G: Herbicide and Surfactant Information Sheets

Page G-19, Appendix G, Toxicity, Agrindex:

AGRI-DEX® has an LD50 for {rats} of over 2000 mg/kg, and an LC50 of over 1000 for bluegill sunfish, rainbow trout (96 hour exposure) and *Daphnia magna* (48-hour exposure) suggesting a relatively low toxicity (McLaren and Hart 1995).