Yosemite National Park

National Park Service
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Invasive Plant Management Plan for Yosemite National Park

Finding of No Significant Impact
Errata Sheets

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Finding of No Significant Impact Invasive Plant Management Plan for Yosemite National Park

Lead Agency: National Park Service
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Purpose and Need

Introduction

This Finding of No Significant Impact documents the decision of the National Park Service to adopt a plan to manage invasive plants in Yosemite National Park and the determination that no significant impacts on the human environment are associated with that decision. The purpose of the *Invasive Plant Management Plan for Yosemite National Park* (Invasive Plant Management Plan) is to protect the natural, cultural, and scenic resources of the park by reducing existing invasive plant infestations and preventing the establishment and spread of invasive plants into uninfested areas of the park. The goals of the plan are:

- Prevention and Early Detection – Protect ecosystems from the impacts of invasive plants through an integrated and comprehensive approach that emphasizes the prevention of invasive plant spread through early detection, and treatment of newly established populations.
- Prioritization and Control – Remove invasive plant populations that pose the greatest threat to park resources.
- Outreach and Education – Educate, inform, consult, and collaborate with park employees, concessioners, visitors, park partners, private property holders, and gateway communities to address invasive plant issues.
- Monitoring and Research – Ensure that the invasive plant program is regularly monitored and improved, environmentally safe, and supported by science and research.
- Ecological Restoration – Restore ecosystems and key ecological processes that have been impacted by invasive plant species.

Need

The diversity of native plants in Yosemite National Park is striking; although Yosemite accounts for less than 1 percent of the land mass of California, the park contains representatives of nearly 23 percent of all native plant species in the state. The diverse plants and associated wildlife habitats of Yosemite National Park are vulnerable to the invasion and spread of non-native plants. Over 175 non-native plants have been documented within the park, including almost 100 acres of non-native yellow star-thistle (*Centaurea solstitialis*) and 60 acres of non-native blackberry (*Rubus discolor*, *R. laciniatus*).

Non-native plants are distributed along an elevation gradient across the Yosemite landscape. Vast expanses of the highest elevations in the park are free of non-native plants, while non-native plants dominate some low-elevation areas. Most of the weed free zones are found in Wilderness areas of the park. It is of critical importance to control invasive plants in the low-elevation areas in

order to halt the spread of invasive plants into intact and pristine Wilderness. If measures to prevent and curtail the spread of invasive plants are not enacted, invasive plants will continue to change and displace the living resources of Yosemite.

The Invasive Plant Management Plan defines an effective and ecologically sound strategy to manage invasive plants in Yosemite National Park and the El Portal Administrative Site. The plan is consistent with federal law, regulation, and policy guidance, including the 2008–2012 National Invasive Species Management Plan (NISC 2008), the *General Management Plan for Yosemite National Park* (NPS 1980), NPS Management Policies (NPS 2006), and the Federal Noxious Weed Act – Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148), enacted January 3, 1975. A complete description of the proposal and its environmental consequences are contained in the *Invasive Plant Management Plan for Yosemite National Park Environmental Assessment* (EA) (NPS 2008).

Alternatives Analyzed

The National Park Service analyzed three alternatives in the Invasive Plant Management Plan EA:

- Alternative 1: No Action Alternative
- Alternative 2: Eradicate or Prevent the Spread of High- and Medium-High-Priority Invasive Plants into Natural Habitats
- Alternative 3: Eradicate or Prevent the Spread of High-, Medium-High-, and Medium Priority Invasive Plants into Natural Habitats

Alternatives 2 and 3 are comprehensive proposals that include the following elements for the management of invasive plants: prevention, early detection and rapid response, prioritization, monitoring, education, and research. Alternatives 2 and 3 would manage invasive plants using integrated pest management techniques. Integrated pest management is a science-based, decision-making process that coordinates knowledge of invasive plant biology, while posing the least possible risk to people, resources, and the environment. Integrated pest management embraces a full range of management techniques, including manual, mechanical, and chemical control.

Based on this analysis, the National Park Service has identified Alternative 2 as the Agency's Preferred and Environmentally Preferable Alternative and has selected this alternative for implementation. The Selected Alternative, Alternative 2, will protect sensitive natural and cultural resources, enhance the visitor experience, and comply with the policy mandates. No major issues were raised by other agencies, American Indian Tribes, or the public. As a result of public and agency comment, additional mitigation measures were included for the protection of the Yosemite toad (*Bufo canorus*), California red-legged frog (*Rana aurora draytonii*), and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). A larger 10-foot, "no herbicide" buffer zone was created around standing and flowing water. Due to public concerns about the surfactant R-11, the plan was changed to include R-11 or a surfactant with less potential toxicity. This surfactant would be used only in wetland areas that have a dry phase, and during the dry phase. Non-native blackberry is an example of a plant that grows in wetlands during the dry phase.

In Wilderness areas, an integrated pest management approach using manual, mechanical, or chemical control methods, with an emphasis on early detection and prevention, is the minimum tool required to meet management objectives for Wilderness in Yosemite. This is the most effective strategy to keep invasive plants out of the Wilderness and to avert the need for larger-scale control efforts.

Actions Common to All Alternatives

The park will implement the following actions under all of the alternatives described in the Invasive Plant Management Plan EA:

- Prioritize invasive plants for early detection and control.
- Conduct early detection activities for invasive plants that threaten Yosemite from outside its borders.
- Use of a full range of integrated pest management techniques, without the use of chemical treatments.
- Monitor to detect the efficacy of control actions.
- Promote outreach and education to foster an understanding of invasive plant prevention and control
- Integrate ecological restoration actions to control invasive plants and prevent invasive plant re-infestations.

Selected Alternative – Alternative 2: Eradicate or Prevent the Spread of High- and Medium-High-Priority Invasive Plants into Natural Habitats

Under the Selected Alternative, an extensive program staffed by park employees and supervised volunteers will employ an integrated pest management approach to detect, control, and prevent high- and medium-high-priority invasive plants from spreading into uninfested areas. Work crews will use a variety of manual and mechanical control techniques. As necessary, the National Park Service will use herbicides to control up to 22 high- and medium-high-priority invasive plants, those that pose the greatest threats to natural communities in the park (see Table I). Work crews would treat medium-priority plants—those that tend to favor disturbed sites and generally do not have the potential to invade into undisturbed natural communities—with manual and mechanical control techniques. Actions considered in the Selected Alternative meet the criteria of the Wilderness Minimum Tool Requirements Analysis for the Invasive Plant Management Plan.

Manual and mechanical control techniques will be the preferred method to treat invasive plants. Two herbicides – glyphosate and aminopyralid – will be used to control the highest priority invasive plant populations when the park cannot meet management objectives using other methods (see Table I). Program managers would develop annual work plans that would include the time and planned locations of herbicide applications, and distribute this information to the public via the Yosemite National Park website and other print media before herbicide applications take place.

Table I: Species Identified for Herbicide Use and Herbicide Use Thresholds under Alternative 2			
Species	Estimated Acres in Yosemite	Herbicide[1]	Herbicide Use Population Size or Location Thresholds
Invasive Plants That Currently Meet Thresholds for Herbicide Use Under Alternative 2			
Ailanthus altissima (Tree-of-heaven)	<1 acre estimated parkwide	Glyphosate	Population size of one or more plants (due to lack of effective alternative methods to control this species)
Bromus tectorum Cheat grass	Unknown	Glyphosate	Population must be larger than 20 square meters (65.6 square feet)
Centaurea maculosa (Spotted knapweed)	<1 acre	Aminopyralid	Population size of one or more plants (due to extreme invasibility and tenacious qualities of the species)
Centaurea melitensis (tocalote)	Estimated 5 acres to be treated (100 acres estimated parkwide)	Glyphosate, Aminopyralid	Population must be larger than 10 square meters (32.8 square feet)
Centaurea solstitialis (Yellow star-thistle)	Estimated 5 acres to be treated (100 acres documented parkwide)	Glyphosate, Aminopyralid	Population must be larger than 10 square meters, and located on steep or hard-to-access slopes
Cirsium vulgare (bull thistle)	Estimated <1 acre to be treated (>100 acres estimated parkwide)	Glyphosate	Non-wilderness populations where the density of individuals exceeds 10 per square meter; herbicides would be used only on first-year rosettes (not flowering plants)
Holcus lanatus (Common velvet grass)	Estimated <10 acres to be treated (1,000 total acres estimated parkwide)	Glyphosate	Population must be larger than 5 square meters (16.4 square feet)
Humulus lupulus (Hops)	<1 acre estimated parkwide	Glyphosate	Population must be larger than 5 square meters
Lathyrus latifolius (Perennial sweet pea)	Estimated 2 acres to be treated (3 acres estimated parkwide)	Glyphosate	Population size of one or more plants (due to lack of alternative methods to effectively control this species)
Lepidium latifolium (Perennial pepperweed)	<1 acre	Glyphosate	Population size of one or more plants (due to extreme invasibility and tenacious qualities of the species)
Leucanthemum vulgare (Oxeye daisy)	Estimated <1 acre to be treated (5 acres estimated parkwide)	Glyphosate, Aminopyralid	Populations must be larger than 10 square meters
Robinia pseudoacacia (Black locust)	<1 acre estimated parkwide	Glyphosate	Population size of one or more plants (due to lack of alternative methods to effectively control this species)
Rubus discolor (Himalayan blackberry)	Estimated 50 acres to be treated (60 acres estimated parkwide)	Glyphosate	Population size of one or more plants (due to lack of other methods to effectively control this species)
Rubus laciniatus (Cutleaf blackberry)			
Vicia benghalensis (vetch)	<5 acres	Glyphosate	Any population where the density of rosettes exceeds 10 per square meter
Invasive Plants That Do Not Currently Meet Herbicide Use Thresholds Under Alternative 2, but May Meet Thresholds in the Future			
Arundo donax (Giant reed)	<1 acre	Glyphosate	If plants persist after two timed manual and/or mechanical treatments
Carduus pycnocephalus (Italian thistle)	<1 acre	Glyphosate, Aminopyralid	Population must be larger than 5 square meters with greater than 50 percent cover
Cynodon dactylon (Bermuda grass)	<1 acre	Glyphosate	Population must be larger than 1 square meter with greater than 50 percent cover
Genista monspessulana (French broom)	<1 acre	Glyphosate	Population must be larger than 5 square meters with greater than 50 percent cover
Hedera helix (English ivy)	<1 acre	Glyphosate	Population must threaten a wetland or riparian area and be larger than 2 square meters (6.6 square feet) with greater than 50 percent cover
Trifolium hirtum (Rose clover)	10 acre	Glyphosate	Population must be found above 4,000 feet in elevation and larger than 5 square meters with greater than 50 percent cover
Vinca major (Greater periwinkle)	<1 acre	Glyphosate	Population must threaten a wetland or riparian area and be larger than 2 square meters with greater than 50 percent cover

[1] Glyphosate would be applied at no more than the equivalent of 4 quarts per acre per year.
Aminopyralid (currently only available in the form of Milestone®) would be applied at no more than the equivalent of 7 ounces per acre per year.

Currently, 15 of the 22 invasive plant species proposed for herbicide use under Alternative 2 meet the specified population size and location criteria. Work crews would not use herbicides on the remaining seven species unless population sizes change to meet the thresholds identified in Table I. Program managers would also consider herbicide use for newly discovered invasive plants in the park if the California Invasive Plant Council or the California Department of Food and Agriculture List of Noxious Weeds consider the species an ecological threat.

Park staff will monitor to document the locations of invasive plants, determine whether management objectives were met, and ensure the effectiveness of control techniques. During an annual review of the program's management objectives, managers will incorporate new information from the research community. The projected lifespan of this plan is ten to fifteen years, as long as the plan continues to be effective, efficient, and the best strategy to meet management goals. The herbicides prescribed are expected to remain effective during this time span.

Alternative 1: No Action Alternative

The No Action alternative would maintain the status quo and provide a baseline from which to compare the action alternatives, evaluate the magnitude of proposed changes, and measure the environmental effects of those changes.

Under Alternative 1, current management practices and invasive plant management would continue in the park. Under the existing program, park employees and volunteers would continue to use existing techniques (both manual and mechanical) to detect and prevent invasive plant populations in the park from spreading into uninfested areas. Herbicides would not be used for invasive plant control. The extent of the land area in Yosemite treated for invasive plants would remain approximately the same over time. While densities of selected invasive plant populations may decrease, the park would not meet the goals of the Invasive Plant Management Plan EA.

Alternative 3: Eradicate or Prevent the Spread of High-, Medium-High-, and Medium Priority Invasive Plants into Natural Habitats

Under Alternative 3, the park would meet management objectives for medium-priority invasive species, as well as for high- and medium-high-priority species. Medium-priority species tend to occur in disturbed areas such as road corridors, campgrounds, parking lots, and staging areas. Medium-priority species do not have as great a potential to invade natural plant communities as do the higher-priority plants. Under Alternative 3, park crews would use herbicides to control up to 35 invasive plant species (out of 177 non-native plants in the park) if specific management objectives for each species cannot be met through other control methods and invasive plant populations met size thresholds. Two herbicides would be used – glyphosate and aminopyralid. Actions considered in Alternative 3 meet the criteria of the Wilderness Minimum Tool Requirements Analysis for the Invasive Plant Management Plan. This alternative would accept more herbicide use than Alternative 2.

Alternatives Considered but Dismissed

The National Park Service considered a range of actions when developing possible alternatives for the Invasive Plant Management Plan. Of the actions analyzed, some were dismissed 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.

Use of Domestic Herbivores to Control Invasive Plant Populations

Large mammalian herbivores such as goats and cattle can be used to manage invasive species. However, they can also cause unintended and unwanted secondary impacts by trampling or consuming native vegetation and by altering nutrient cycles. For example, goats have been shown to be effective at controlling yellow star-thistle. However, a majority of the yellow star-thistle in Yosemite is located on very steep slopes with thin soils that could be stripped of vegetation and topsoil if goats were released to control this species. As a result, this action was dismissed because it would cause unacceptable environmental impacts.

Use of New Biological Control Agents

Biological control (also known as biocontrol) involves the introduction of herbivores or pathogens, such as insects or fungi, which infest invasive species and reduce their ability to persist and produce seeds. An effective biological control agent introduced to attack invasive plant populations must be highly host-specific. The biological control agent must only affect the target plant, and show little or no affinity for native species that could be closely related to the invasive plant. Biological control agents undergo rigorous laboratory and field testing by the U.S. Department of Agriculture and the State of California before approval for use in agricultural or natural settings.

Biocontrol has been used extensively to control invasive plant species in North America. Flea beetles (*Aphthona lacertosa* and *Aphthona nigriscutis*) have been used to reduce leafy spurge (*Euphorbia esula*). The beetle *Chrysolina quadrigemina* has been introduced to control populations of St. John's wort (*Hypericum perforatum*) (Harris 1988). Yosemite National Park introduced a chrysomelid beetle in Yosemite Valley to control St. John's wort in the 1980s. In 1994 and 1995, the peacock fly (*Chaetorellia australis*), the hairy weevil (*Eustonopus villosus*), and the false peacock fly (*Chaetorellia succinea*) were introduced in El Portal to help control yellow star-thistle.

In the foreseeable future, there are no invasive plant species in Yosemite that require the release of a biological control agent to meet management goals. If this situation changes, the only biocontrol agents covered under the Invasive Plant Management EA that will be released in Yosemite National Park are the four species that have been released in the past to control yellow star-thistle and St. John's wort. Park managers will consider the rerelease of these biocontrol agents only if new ecosystem-level threats emerge.

Use of Additional Herbicides for Invasive Plant Control

Park managers considered six herbicides for use during the development of the Invasive Plant Management Plan. Two of the herbicides—glyphosate and aminopyralid—were accepted and proposed for use in specific situations under Alternatives 2 and 3. Program managers rejected the

use of four herbicides—triclopyr, imazapyr, clopyralid, and 2,4-D—to minimize environmental risks.

Use of Aircraft for Aerial Herbicide Application

Program managers rejected the use of aircraft (such as airplanes and helicopters) for aerial application of herbicides or project logistics because less-intrusive options are available to meet management goals.

Environmentally Preferable Alternative

The National Park Service is required to identify the environmentally preferable alternative in the environmental documents it produces for public review and comment. The National Park Service, in accordance with National Environmental Policy Act (NEPA) Section 101(b) (516 DM 4.10), defines the environmentally preferable alternative as the alternative that best promotes the national environmental policy. 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, the No Action alternative, seeks to meet the environmental policy goals by using manual and mechanical invasive plant control techniques, without the use of herbicides. This alternative would not meet management objectives for the control of high-priority invasive plants. For example, particularly invasive species such as non-native blackberry and yellow star-thistle would continue to spread into uninfested areas because their rate of spread exceeds the ability of manual and mechanical methods to control these species. Highly valued resources such as wetland habitat, rare plant habitat, and scenic vistas would remain susceptible to invasive plant invasion. Over time, visitors would find an accelerated or exponential rate of deteriorating conditions in natural and scenic areas.

Alternative 2, the Selected Alternative, seeks to meet the environmental policy goals by initiating a program to protect uninfested areas of Yosemite National Park from invasions of high- and

medium-high-priority invasive plants. The park will selectively use herbicides if the park staff is unable to meet management objectives through the use of manual or mechanical control methods. The park will use two herbicides—glyphosate and aminopyralid—to control up to 22 identified invasive plant species that meet identified thresholds.

Alternative 3 seeks to meet the environmental policy goals by initiating a program to protect uninfested areas of Yosemite National Park from invasions of high-, medium-high-, medium-priority invasive plants. The park would use herbicides if park staff is unable to meet management objectives by using manual or mechanical control methods, and to increase efficiency (i.e., allowing park staff to treat medium-priority invasive plants as well as high-priority invasive plants). The park would use two herbicides—glyphosate and aminopyralid—to control up to 35 identified invasive plant species that meet identified thresholds.

Alternative 1 would not use herbicides as an invasive plant control technique. As a result, there would be no potential for staff, visitor, or environmental safety hazards related to the use of herbicides. Under Alternatives 2 and 3, park staff would use low-toxicity herbicides to control certain species of invasive plants that have exceeded defined thresholds or that are difficult to eradicate or control using manual or mechanical techniques. The Selected Alternative will use the minimum amount of low-toxicity herbicides required to prevent the highest-priority invasive plants from spreading into natural communities inside the park. Herbicide use will drop off and remain low under the Selected Alternative as target invasive plant populations reach control objectives. Under Alternative 3, the park would meet management objectives for medium-priority invasive species, as well as high- and medium-high-priority species. Medium-priority species are found generally in disturbed areas such as road corridors, campgrounds, parking lots, and staging areas. As mentioned above, under Alternative 3, park crews would use herbicides to control up to 35 invasive plant species if objectives could not be met through other control methods and invasive plant populations met size thresholds. The amount of herbicide use is expected to remain the same over time under Alterative 3.

The Selected Alternative fulfills the responsibility of this generation as trustees of the environment for succeeding generations because it prescribes actions to effectively protect uninfested areas in Yosemite from biological, aesthetic, and cultural impacts of the park's most threatening invasive plants. Thus, the Selected Alternative will preserve important historic, cultural, and natural aspects of our national heritage. The Selected Alternative prescribes the minimum amount of low-toxicity herbicides required to meet management goals, thereby minimizing unforeseen safety risks. Herbicide use will comply with federal and state laws. Herbicide applicators will have proper training, certification, and supervision. The actions prescribed under Alternative 1 would not meet the management goals for invasive plants in Yosemite National Park, which aim to preserve the natural aspects of our national heritage. The actions prescribed under Alternative 3 would meet management goals for more invasive plants than the Selected Alternative, but these species are not as great of a threat to natural areas within Yosemite. The actions prescribed under Alternative 3 would also require more herbicide use, and for a sustained amount of time. Alternative 3 would not be consistent with integrated pest management goals, which aim to minimize herbicide use and unforeseen safety risks, among other goals. The Selected Alternative best meets the criteria of the environmentally preferable alternative under NEPA, as outlined in Section 101, of the alternatives analyzed for the Invasive Plant Management Plan.

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

The National Park Service analyzed the significance criteria provided 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 National Park Service 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. There will be long-term, moderate, beneficial impacts on soil microorganisms and chemistry, wetlands, native vegetation, wildlife, special-status plants, wilderness character, and scenic resources. There will be a long-term minor beneficial impact on the American badger (*Taxidea taxus*) and great gray owl (*Strix nebulosa*), visitor experience, recreation, and park operations. There will be a long-term negligible beneficial impact on the valley elderberry longhorn beetle, willow flycatcher (*Empidonax trailii*) habitat, the Yosemite toad (*Bufo canorus*), California red-legged frog (*Rana aurora draytonii*), and the Sierra Nevada yellow-legged frog (*Rana sierrae*). Adverse impacts will include long-term, negligible, adverse impacts on hydrology and water quality, air quality, the park's sound environment. There would be negligible impact on the peregrine falcon (*Falco peregrinus anatum*), and bald eagle (*Haliaeetus leucocephalus*). There will be no effect on the Sierra Nevada red fox (*Vulpes vulpes necator*), California wolverine (*Gulo gulo*), Pacific fisher (*Martes pennanti*), or Sierra bighorn sheep (*Ovis canadensis californiana*). There will be no adverse effects on archeological resources or cultural landscapes. Short-term impacts with adverse effects will be reduced by the application of Best Management Practices and resource-specific mitigation measures (see Mitigation, below).

Soils

Manual and mechanical invasive plant control techniques can disturb sensitive and other soil types. The use of herbicides in specific situations minimizes soil disturbance in sensitive soil types and in the vicinity of archeological sites. There will be a long-term moderate beneficial impact on soil microorganisms, soil chemistry, and hydrologic cycles, as the use of herbicides in selected locations minimizes soil disturbance. The limited use of integrated pest management techniques will have a short-term negligible adverse effect on soil quality as the selected herbicides break down rapidly after application. Overall, there will be long-term, moderate, beneficial impacts on soil microorganisms, soil chemistry, and hydrologic cycles as invasive plant populations are controlled and eradicated.

Hydrology and Water Quality

As a result of agency comment, the National Park Service has increased the buffer zone for no herbicide use around standing or flowing water, from six feet to ten feet. Increased prevention, early detection, and monitoring under the Selected Alternative will have a negligible beneficial impact on water quality. The Selected Alternative will result in less sediment loading or turbidity than the No Action alternative because there would be less ground disturbance in sensitive soils where herbicides are used as a control technique rather than hand digging. Because there will be limited herbicide use with less ground disturbance in sensitive soils, and limited reductions in

other sources such as weed trimmers and equipment, the overall impact on water quality will be long term, negligible, and adverse.

Wetlands

Under the Selected Alternative, the National Park Service will not use herbicides in standing or flowing water, or on plants growing in standing water. There will be a buffer zone for no herbicide use around standing or flowing water. As a result of agency comment, the National Park Service has increased the buffer zone from 6 feet to 10 feet. As a result of public comment, work crews would use aquatic-approved formulations of glyphosate with an R-11 surfactant*, or an approved aquatic surfactant with lesser potential toxicity* in wetlands during a dry phase. Non-native blackberry is an example of an invasive plant that can grow in wetlands with a dry phase. The environmental consequences analysis in the Invasive Plant Management Plan EA remains the same. Early detection and prevention measures will have a long-term minor beneficial impact on wetlands under the Selected Alternative. The use of herbicides will allow the park to meet management objectives for nine invasive plants with the potential to invade wetlands that otherwise will not be controlled using manual and mechanical techniques. The number of wetland acres the park could treat each year will increase, and the number of follow-up treatments will be reduced, thereby resulting in a short-term negligible adverse impact and a long-term moderate beneficial impact on wetlands in the park.

Vegetation

Under the Selected Alternative, the park will meet management objectives for high- and medium-high-priority invasive plant species with the highest potential to invade natural communities. This will protect a variety of native plant communities, including foothill woodland, riparian, and meadow communities from the threat of non-native invasive plants. For example, the spread of non-native blackberry populations into meadow habitat will be halted, as will the spread of yellow star-thistle into foothill woodland communities. The use of integrated pest management techniques will greatly reduce the amount of ground disturbance and increase the treatment area each year. Overall, the Selected Alternative will result in a long-term moderate beneficial impact on native vegetation in the park.

Wildlife

Actions proposed for the Selected Alternative will protect and increase the size of intact wildlife habitat in the park. The use of selected herbicides in concert with mitigation measures and labeling restrictions carries little to no risk to amphibians and other wildlife, given that there will be no aerial applications of herbicides. The judicious use of herbicides will also reduce the amount of ground disturbance that results from the use of manual and mechanical techniques. The Selected Alternative will result in a long-term moderate beneficial impact on wildlife in the park through maintaining natural plant communities and habitats throughout the park.

Special-status Plants

The early detection and rapid response, prevention, prioritization, monitoring, research, and education practices in the Selected Alternative will reduce the risk of new invasive plant infestations in special-status plant habitat. Control methods prescribed in the Selected Alternative will have a long-term moderate beneficial impact on special-status plant species due to the potential to eliminate invasive yellow star-thistle and other invasive plants from special-status

species habitat. Overall, the actions prescribed in the Selected Alternative will have a long-term moderate beneficial impact on special-status plant habitat.

Special-status Wildlife

As a result of informal consultation with the U.S. Fish and Wildlife Service (see the Coordination section) and public comment, the following mitigation measures have been added to the Invasive Plant Management Plan EA:

- No mechanical treatment or herbicide spraying will take place within 30 meters (100 feet) of elderberry shrubs (*Sambucus mexicana*) during the valley elderberry longhorn beetle flight season (typically occurring between mid-April and mid-June).
- No mechanical treatment or herbicide spraying will take place within 9 meters (30 feet) of any elderberry shrubs. Within 9 meters (30 feet) of any elderberry shrub, only manual removal of invasive plants will take place.
- Pre-work surveys will be conducted in suitable California red-legged frog habitat prior to mechanical control of vegetation or the application of herbicides. If any listed frogs are found, work will not take place until the U.S. Fish and Wildlife Service is contacted.
- Herbicides will not be applied within 750 meters (2,500 feet) of known breeding habitat for the Yosemite toad. Above 2,100 meters (7,000 feet) in elevation, if invasive plant eradication activities are planned to take place in appropriate habitat for the toad in an area that has not been surveyed for the Yosemite toad, surveys will take place prior to control activities. Surveys will take place within two months after Yosemite toad breeding times, when the toad is in its tadpole stage.

Implementation of the Selected Alternative will contribute to the restoration of vegetation communities and habitat areas potentially supporting special status wildlife species in Yosemite. The impact analysis on the Yosemite toad has been revised from a long-term negligible adverse impact, to a negligible beneficial impact due to mitigation measures to protect aquatic and wetland habitats and wetland habitat that will be restored as invasive plants are removed. There will be a long-term minor beneficial impact on the American badger and great gray owl. There will be a long-term negligible beneficial impact on the valley elderberry longhorn beetle, willow flycatcher habitat. There will be negligible impacts on the peregrine falcon and bald eagle. There will be no effect on the Sierra Nevada red fox, California wolverine, Pacific fisher, or Sierra bighorn sheep.

Air Quality

Increased prevention, early detection, and monitoring proposed under the Selected Alternative will have long-term negligible adverse impacts on air quality. The proposed use of integrated pest management techniques will result in long-term negligible adverse impacts on air quality.

Noise

Existing noise disturbance regimes will continue during routine operations to control invasive plants. The use of hand tools will continue to generate small amounts of noise. The mechanical equipment currently used is comparable to mowers and weed trimmers used by the typical homeowner. The noise created by the actions in this alternative is small relative to the existing noise environment of the park. Noise from the activities described in the Selected Alternative will result in a negligible long-term adverse impact to the park's sound environment.

Wilderness

Early detection and prevention actions will have a long-term moderate beneficial impact on Wilderness values, as these actions will help prevent the invasion of non-native species into areas largely free of invasive plants. Hand-pulling invasive plants could temporarily create noticeable ground disturbance, resulting in a short-term moderate adverse impact and a long-term minor beneficial impact on Wilderness character.

Archeological Resources

The control of invasive plants will require treatment measures that involve ground-disturbing activities. Although ground disturbance has the potential to damage or expose archeological resources, any impacts resulting from these treatment activities, the park will mitigate these impacts in accordance with procedures in the Yosemite Programmatic Agreement (NPS 1999). In some cases, these procedures could preclude the use of the control techniques proposed under the Selected Alternative. However, the use of herbicides in areas where ground disturbance is not permitted will allow those invasive plant populations to be controlled. There will be no adverse effects on archeological resources due to prevention or control efforts. Impacts due to invasive plant control activities will be mitigated in accordance with the Yosemite Programmatic Agreement such that no adverse effects on archeological resources will result.

American Indian Traditional Cultural Properties

Invasive plant species will be controlled using treatment measures that require ground disturbance; these ground-disturbing treatment measures could damage or displace traditionally gathered plant populations. However, traditionally gathered plant populations can be impacted by the continued spread of invasive plants, and can generally benefit from the removal of invasive plants. Other kinds of non-archeological traditional cultural properties will not be affected. Herbicides will not be used where they could have a negative effect in traditional resource areas. The National Park Service will develop mitigation for potential impacts to traditional cultural properties on a case-by-case basis, in consultation with the appropriate American Indian Tribes. Overall, the Selected Alternative will result in no adverse effect.

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. After consultation with a historical landscape architect, the park will mitigate impacts related to invasive plant control activities in accordance with the Yosemite Programmatic Agreement (NPS 1999) such that no adverse effects on the cultural landscape will result.

Scenic Resources

The Selected Alternative will result in a short-term minor adverse impact on scenic resources due to the impacts of control activities. There will be long-term moderate beneficial impacts on scenic resources as native vegetation is restored. The use of integrated pest management techniques under the Selected Alternative will increase the area of restored vegetation and allow the park to meet management goals.

Visitor Experience and Recreation

The Selected Alternative will result in a short-term minor adverse impact on the visitor experience and recreation due to the localized effects of control activities. 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

Under the Selected Alternative, there will be a short-term moderate adverse impact 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:

> *. . .a "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.*

The analysis for cumulative effects in the Invasive Plant Management Plan EA under all impact topics did not identify any significant cumulative impacts. In many cases, past impacts have been adverse, long term, and major. This is true in the case of the following impact topics: soil ecosystems in California, hydrology and water quality, wetlands, vegetation, special-status plants, air quality, noise, scenic resources, and park operations. Present and foreseeable future actions would contribute to reversing the major adverse impacts of past actions, and would produce long-term minor to moderate benefits. When combined with the benefits of the Selected Alternative the result is a long-term adverse minor impact. In the case of wildlife, special-status wildlife, and Wilderness, when adverse past, present, and foreseeable future impacts are combined with the beneficial impacts of the Selected Alternative, the effects are long term, adverse, and moderate. There would be no adverse cumulative effects on archeological resources, traditional cultural properties, or the cultural landscape. There would be long-term minor beneficial cumulative impacts on the visitor experience and recreational resources.

Non-impairment of Park Resources

Pursuant to the 1916 Organic Act, the National Park Service 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 National Park Service cannot take an action that will "impair" park resources or values.

Based on the analysis provided in the Invasive Plant Management Plan EA, the National Park Service concludes that implementation of the Selected Alternative – Eradicate or Prevent the Spread of High- and Medium-High-Priority Invasive Plants into Natural Habitats 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 National Park Service planning documents. Consequently, implementation of the Selected Alternative will not violate the 1916 Organic Act.

Mitigation

The mitigation measures presented in Table II have been incorporated into the Selected Alternative to avoid or reduce impacts to park resources.

Herbicide Use and Storage Protocol

Herbicides will be handled only by those trained and certified by the California Department of Pesticide Regulation. All herbicides use will conform to U.S. Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and State of California work safety standards and pesticide regulations, as well as internal National Park Service work safety and integrated pest management policies.

All application methods will comply with label restrictions and involve the least amount of herbicide needed to achieve management goals. All weed control efforts will use focused application methods and ensure that only specific targeted plants are affected. Only herbicides appropriate for the targeted species will be used within Yosemite National Park, including designated Wilderness, and they will be applied as prescribed by their label and as approved by the regional integrated pest management coordinator. Manufacturer's guidelines will be followed at all times.

Application Equipment

Work crews will abide by the following protocols for herbicide application equipment:

- Work crews will keep herbicide application equipment in good working order and routinely evaluate equipment for leaks, cracks, loose fittings, bad gaskets, signs of spillage, or any other indication of real or potential leakage.
- Work crews will equip spray equipment with pressure-limiting valves and check valves to reduce pressure at the wand tip and to prevent dripping. Work crews will install specialized tips to aid in control of droplet size and to reduce potential for herbicide drift.
- Filters will be embedded in the sprayer wand to keep debris out of the spray nozzle and to ensure an even and predictable spray pattern.
- Crews will routinely calibrate spray equipment to ensure proper functioning and desired application rates.

Table II. Mitigation Measures			
	Impact Topic	Responsibility	Critical Milestone
NATURAL RESOURCES			
▪ During the annual planning phase of invasive plant control activities, the National Park Service shall determine whether special-status plant species 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. ▪ During the planning phase of invasive plant control activities, biologists shall determine whether invasive plant control measures will take place in likely habitat for special-status wildlife. If invasive plant control work will take place in likely special-status wildlife habitat, surveys will be conducted before any type of invasive plant control measures will be performed. In the event that special-status wildlife occupy areas planned for treatment with herbicides, chemical treatments will not be conducted, and managers will develop site-specific mitigations to ensure no adverse effects to special-status wildlife. ▪ No mechanical treatment or herbicide spraying will take place within 30 meters (100 feet) of elderberry shrubs during the flight season (typically occurring between mid-April and mid-June). ▪ No mechanical treatment or herbicide spraying will take place within 9 meters (30 feet) of any elderberry shrubs. Within 9 meters (30 feet) of any elderberry shrub, only manual removal of invasive plants will take place. ▪ Pre-work surveys will be conducted in suitable California red-legged frog habitat prior to mechanical control of vegetation or the application of herbicides. If any listed frogs are found, work will not take place until the U.S. Fish and Wildlife Service is contacted. ▪ Herbicides will not be applied within 750 meters (2,500 feet) of known breeding habitat for the Yosemite toad. Above 7,000 feet in elevation, if invasive plant eradication activities are planned to take place in appropriate habitat for the toad in an area that has not been surveyed for the Yosemite toad, surveys will take place prior to control activities. Surveys will take place within two months after Yosemite toad breeding times, when the toad is in its tadpole stage. ▪ Work crews will not apply herbicides in standing water, or within 9 meters (10 feet) of standing water. ▪ In the case of non-native blackberry, work crews will cut down and remove plant foliage prior to herbicide treatments. Later in the year, or the following year, work crews will follow up with foliar spray herbicide treatments on resprouts, which will not have developed berries. This will reduce the risk of wildlife or humans ingesting sprayed berries. ▪ Program managers shall schedule invasive plant activities when such activities are least likely to disturb great gray owls and other special-status birds. ▪ The park shall revegetate or reseed treatment areas with native species if areas require revegetation after invasive plant control activities. ▪ If weed control efforts leave areas devoid of vegetation, the park shall implement erosion control methods as needed. ▪ Prior to leaving weed control areas, all 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. ▪ All equipment shall be kept clean and free of mud, dirt, vegetative debris, or other materials that could contribute to the spread of weeds in the park. ▪ Park vehicles shall be kept clean, and parked outside of invasive plant populations.	Special-status plants Special-status wildlife	Yosemite National Park program manager Yosemite National Park project manager	Planning phase

Table II. Mitigation Measures			
	Impact Topic	Responsibility	Critical Milestone
NATURAL RESOURCES (continued)			
▪ Work crews shall properly dispose of viable seeds and plant materials to prevent the spread of noxious weeds. ▪ All vegetation crews shall be "Bear Aware" by using appropriate food handling and storage techniques. ▪ Should pack stock be required to support invasive plant prevention or control activities, stock would be fed only certified weed-free feed.			
CULTURAL RESOURCES			
▪ Prior to any ground-disturbing activity, the park shall consult with National park Service archeologists. Archeologists shall review proposed treatments for the development of mitigation strategies to ensure no adverse impacts to archeological resources. ▪ During the planning phase of invasive plant control activities, managers will coordinate with the Park Historic Preservation Officer and Native American Liaison to consult associated American Indian Tribes to ensure no adverse impacts to traditional cultural properties or resources. ▪ The park shall not conduct ground-disturbing activities on identified archeological sites without prior approval from the park archeologist. A professionally qualified archeological monitor will be present as recommended by the park archeologist. ▪ During the planning phase of invasive plant control activities, project managers shall consult with National Park Service cultural landscape architect to ensure no adverse impacts to historic cultural landscapes. ▪ The park shall incorporate the protection of cultural resources in annual training programs for invasive plant work crews. ▪ The park shall not remove non-native vegetation that is a critical component of American Indian cultural properties.	Archeological Resources Traditional Cultural Properties Cultural Landscape	Yosemite National Park program manager Yosemite National Park project manager	Planning phase and concurrent with project activities
AIR QUALITY			
▪ The park shall use low-smoke, two-cycle oil in all two-cycle equipment employed to control non-native plants. ▪ As equipment powered by two-cycle engines wears out and becomes irreparable, it shall be replaced with equivalent four-stroke equipment, if such equipment exists and has sufficient power-to-weight ratios to be practical in the field.	Air Quality	Yosemite National Park program manager, Yosemite National Park project manager	Concurrent with project activities
NOISE			
▪ Plant management crews shall not leave motorized equipment running when it is not in use. ▪ All work that generates noise levels above 76 decibels near residential or visitor use areas shall be performed between 8:00 a.m. and 5:00 p.m.	Noise	Yosemite National Park program manager, Yosemite National Park project manager	Concurrent with project activities
*WILD AND SCENIC RIVER CORRIDORS			
▪ During the planning phase of invasive plant control activities, managers shall fill out and submit the Wild and Scenic River Invasive Plant Control Questionnaire (Appendix J in the Invasive Plant Management Plan EA) to determine if Section 7 Determinations are necessary for the project. ▪ Work crews shall not apply herbicides below the ordinary high water mark of Wild and Scenic Rivers or their tributaries.	Wild and Scenic River Act Compliance	Yosemite National Park program manager, Yosemite National Park project manager	Prior to and concurrent with project activities

Table II. Mitigation Measures			
	Impact Topic	Responsibility	Critical Milestone
BIOLOGICAL CONTROL			
▪ Only biological control agents approved by the U.S. Dept. of Agriculture Animal and Plant Health Inspection service will be used. ▪ When considering the use of a biological control agent, the program manager will confirm its use is necessary and that all other treatment options are either not acceptable or feasible. ▪ Before a biological control agent is released, the resource specialist will receive approval from the National Integrated Pest Management Coordinator to release the agent. ▪ The transport, handling, and release of biological control agents will be in accordance with all permit conditions. The park will report annual releases of biological control agents to the Regional Integrated Pest Management Coordinator. ▪ The number of biological control agents released will account for the size and density of the treatment area and the number of agents required to maintain a viable biological control agent population. ▪ Releases will be synchronized with the time period when the host plant is present. Biological control agents will be released at times of the day when they will not disperse from the treatment area. ▪ Surveys for biological control agents will be completed several times during the season to monitor biological control agents.			
WILDERNESS			
▪ Before program managers consider herbicide use, invasive plant populations shall be at an ecosystem-level threat to Wilderness character and resources, determined to be the minimum tool for control, and meet the location and size thresholds. ▪ Herbicide use shall meet the conditions of the Wilderness Minimum Tool Requirements Analysis for the Invasive Plant Management Plan. ▪ Crews shall follow "Leave No Trace" camping and work protocols. ▪ Crews shall be limited to legal group size limits (15 in trailed areas, 8 in off-trail areas). ▪ Crews shall minimize the need for pack-stock support. ▪ Work crews shall follow the Herbicide Use Protocol in the Invasive Plant Management Plan.	Wilderness	Yosemite National Park program manager, Yosemite National Park project manager	Prior to and concurrent with project activities
VISITOR AND EMPLOYEE SAFETY			
▪ 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. ▪ 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.	Visitor Use and Recreation	Yosemite National Park program manager, Yosemite National Park project manager	Prior to and concurrent with project activities

Table II. Mitigation Measures			
	Impact Topic	Responsibility	Critical Milestone
VISITOR AND EMPLOYEE SAFETY (continued)			
▪ Prior to project implementation and continuing throughout, all employees shall 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 park shall develop and follow an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan to address hazardous materials storage, spill prevention, and response. Work 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. ▪ With the exception of fuel used for cooking or lighting fires while camping, crews shall not store hazardous or flammable chemicals in the field overnight. All overnight storage shall occur in appropriate locked facilities. ▪ 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, workers 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, workers 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. ▪ Weed control workers (including park workers, as well as interns, volunteers, and contract labor) shall correctly wear all PPE that is appropriate to the job. ▪ Volunteers shall not operate power tools or motorized equipment. ▪ The park Safety Office shall be notified in the event of a hazardous materials spill. All spills shall be documented. ▪ When working on road shoulders, workers 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, workers shall wear appropriate PPE (e.g., hard hats, eye and hearing protection) and shall obey site control rules (sign in and out, etc…) as defined by the entity (National Park Service or contractor) that controls the construction site. ▪ Weed control workers (including park workers, as well as interns, volunteers, and contract labor) shall correctly wear all PPE that is appropriate to the job. ▪ Volunteers shall not operate power tools or motorized equipment.			

Table II. Mitigation Measures			
	Impact Topic	Responsibility	Critical Milestone
HERBICIDE USE			
▪ The Herbicide Use and Storage Protocol for the Invasive Plant Management Plan shall be followed. ▪ The park 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 name, 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. ▪ Invasive plant program managers 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. ▪ 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. ▪ 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.		Yosemite National Park program manager, Yosemite National Park project manager	Prior to and concurrent with project activities

- Crews will attempt to schedule work such that spray equipment will be empty at the end of the work day; however, if not possible, the spray equipment will be tagged to indicate contents, stored in a plastic containment tub, and secured in a locked pesticide holding facility.
- At the end of any work week (or at the end of the day if sprayers will not be used the following day), work crews will empty backpack sprayers into appropriate officially labeled containers. Containers will then be secured in a locked pesticide holding facility.
- Empty containers will be triple rinsed the same day as emptied in accordance with California Department of Pesticide regulations. Wastewater will be retained in containers labeled as "Pesticide Waste Water," and the rinsed containers will list the pesticides contained. Wastewater will be stored, labeled, and handled in the same manner as herbicides. This wastewater will either be reused to dilute additional herbicide for application or disposed of semiannually as chemical waste by the Park Safety Office. After the containers are triple rinsed, they will be labeled as "Triple-Rinsed Pesticide Containers."
- Backpack sprayers will be kept upright when in use.
- During transport or storage, backpack content will be labeled and stored in a U.S. EPA-approved plastic containment tub.
- Dye will be added to the herbicide to make all applications visible; workers will be able to see exactly where the herbicide is being applied. Dye is non-colorfast and fades after two to three weeks.
- Herbicide application will not take place when winds are at greater than 10 miles per hour. Meteorological conditions such as temperature and relative humidity will be taken into account before and during spray hours.
- As stated above, pressure-limiting valves and check valves will be used to prevent dripping at the wand tip when not spraying.

Herbicide Handling and Mixing

Procedures for the handling of pesticides are provided on the pesticide labels. Label guidelines will be followed at all times.

When conditions permit, mixing and loading will occur in developed areas prior to being deployed in the field. A containment tub will be used to catch spills if it is deemed necessary to mix and load in the field. The mixer will be donned with appropriate personal protection equipment (PPE). If an accidental spill were to occur, it will be immediately contained and the contaminant appropriately disposed of. It is a violation of federal law to use herbicides in a manner inconsistent with product labels.

The following precautions will be followed:

- Work crews will wear Occupational Safety and Health Administration-approved safety gear for herbicide handling.
- Mixing will never take place near surface water sources such as streams, rivers, lakes, and riparian areas.
- An air gap will be maintained between any fresh water source and equipment to avoid back-siphoning into the clean water.
- Mixing will take place over a plastic containment tub.

- Mixers will wear appropriate PPE while mixing and loading. Such PPE includes, but is not limited to, face shields, chemical-resistant gloves, long pants, long-sleeved shirts, impervious aprons, and respirators.

Spill Prevention/Response

In case of an accidental herbicide spill, and to prevent accidental spills, work crews will follow these protocols:

- Contact the appropriate authorities.
- Crew members will maintain and have access to a spill response kit while applying herbicides.
- When not in use, all herbicide and application equipment will be stored in clearly labeled and locked facilities. These facilities will be posted with appropriate placards and will contain copies of all material safety data sheets (MSDSs) and product labels, emergency response information, and supplies and equipment needed for spill control. An inventory of facility contents will be maintained off site.
- Work crews will follow product label guidelines and wear appropriate Personal Protection Equipment.

Spill Response

- Consult product labels and MSDSs to determine response and safety protocols.
- Report spills as warranted by information provided on pesticide container labels and MSDSs.
- Wear appropriate Personal Protection Equipment when handling a spill. Crews will be familiar with, maintain, and carry a spill response kit at all times.
- Spill response kits will include a shovel, empty containers, dedicated miscellaneous tools, hose and hose clamps, duct tape, booms and socks, plastic tarp, heavy plastic bags, absorbent material, and spare hardware (nuts, bolts, and screws).

Stopping or Containing Spills

- Identify any spilled product and consult product labels and MSDSs for safety protocols.
- Prevent additional spillage first if can be done safely.
- If in a building or pickup bed, use absorbent material to soak up liquid.
- If on the ground, use booms or socks, then shovel and scrape earth to form dikes to contain the spill. Use plastic sheeting and absorbent material as needed.
- Flag the spill area to indicate parameters.
- As soon as spill is contained, notify the Safety Officer who will determine whether the spill is minor (can be handled using readily available resources) or major (requiring the notification of appropriate authorities).

Collecting Spilled Pesticides and Material

- If not in contact with soil, collect spilled liquid with absorbent material and put into heavy plastic bags or containers. Label, store, and dispose of the contents in the appropriate manner.

- If in contact with soil, collect spilled liquid with absorbent material and contaminated soils, and place in heavy plastic bag or containers. Label, store, and dispose of the contents in the appropriate manner.

Worker Safety

- Only trained and certified employees will handle herbicides.
- Employees working with or near herbicides will wear OSHA-recommended PPE at all times, including, but not limited to, boots, long pants, long-sleeved shirts, eye protection, and chemical-resistant gloves.
- While wearing backpack sprayers, all employees will wear, at a minimum, label-required PPE, which includes long pants, long-sleeved shirts, and shoes and socks.
- The park will provide additional Personal Protection Equipment to those employees who wish to use them.
- The park will provide employees with dedicated facilities to wash the clothing they wear while working with or near herbicides (to prevent the employees from taking contaminated clothing home and possibly contaminating their residences, families, roommates, pets, or shared laundry facilities).
- The park will provide employees with clean extra clothing to wear if their own clothing becomes contaminated.
- Access routes to, from, and around all application areas will be surveyed prior to entering the area with the sprayer. The scouting will focus on finding the safest routes to reduce the chance of falling or stumbling.
- Herbicides will never be transported inside the cab or passenger compartment of a vehicle.
- At every application site, the park will provide workers with contamination safety kits that include soap, clean water for washing, absorbent towels, spare clothing, and eyewash.
- At every application, storage, or handling site, workers will have access to Material Safety Data Sheets, product specimen labels, and information regarding emergency medical response, including directions to the nearest emergency care facility.
- The park will provide showering facilities in El Portal Administrative Site and Yosemite Valley for employees to use in the event of contamination.

Public Safety

- Work crews will sign areas where herbicide application is taking place. .Signage will include the type of herbicide in use, target species, time of application, scope of treated area, re-entry time, and contact information.
- To prevent ingestion of contaminated fruit, mature fruit-bearing blackberry will not be sprayed. Plants will be first mowed, burned, or cut. Subsequent vegetative re-sprouts will then be treated with herbicide. (Re-sprouting vegetation does not produce berries; only stems that are at least two or more years old produce berries.)
- In the event of a spill near or into a body of water, that body of water will be closed to public swimming or boating for at least 24 hours, or until water quality tests determine that the water is safe.
- On Mariposa County and Mariposa Unified School District land assignments and leases, and other land assignments in Yosemite National Park, the National Park Service will work with

agencies and partners to achieve integrated pest management goals. The National Park Service will 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 will not take place without prior notification of local residents.

- Herbicide will not be applied in the yards of residences or within 8 meters (25 feet) of residences without consultation and prior notification of occupants.

Labeling

- All pesticide containers and application equipment will be clearly labeled at all times.
- Labels will state the herbicide (by brand name and active ingredients) in the container, the adjuvants or dilutants added (and at what ratio), the manufacturer name and emergency number, the U.S. EPA Pesticide Registration number, and contact information for the National Park Service person in charge of the spray operation.

Reporting

- All herbicide use will be recorded and filed with the County Agricultural Commissioner and the National Park Service integrated pest management reporting system.
- 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 will immediately be reported to the park Safety Officer and the County Agricultural Commissioner.

Waste Disposal

- In accordance with the directions included on the U.S. Environmental Protection Agency specimen labeling, empty pesticide containers will be triple rinsed, punctured (to prevent re-use), and disposed of with regular garbage.
- Wastewater from triple rinsing could be used to dilute herbicide, but only if the triple-rinsed container contained herbicide and adjuvants compatible with the herbicide being diluted and the desired application methods and sites.
- Liquid waste (including rinse water) that could not be used to dilute herbicide will be labeled and stored with the herbicide in clearly marked and locked locations.
- The labeled waste will be disposed of during the twice annual parkwide toxic waste disposal (in compliance with all state, federal, and local regulations).

Labeling, Material Safety Data Sheets, and Right-to-Know Regulations

Yosemite National Park will not exceed any pesticide label restrictions. All other laws and regulations that apply to pesticide handling, including purchase, storage, transportation, application, and reporting, will also be followed.

OSHA Right-to-Know laws will also apply; all workers have the right to access MSDSs for any toxic chemicals found in the work place. Yosemite National Park will follow all Right-to-Know regulations at all times.

Pesticide labels are regulated by the U.S. Environmental Protection Agency; each commercially sold pesticide formulation has a registered EPA number. These labels describe what can and cannot be done with a particular herbicide, including whether or not it can be used in aquatic situations, and restrictions on how much may be used per acre over a given period. The restrictions printed on pesticide labels are legally binding federal regulations.

Pesticide labels also contain information regarding public and worker safety, first aid, physical and chemical hazards, and many other safety-related subjects, as well as environmental fate and other natural resource-related subjects. The park will never conduct any activity specifically prohibited on the label of the pesticide in use at the time, such as exceeding maximum use rates or non-re-entry intervals.

The park will never deliberately apply terrestrial-use herbicides into aquatic systems.

Although the park is proposing to use aquatic formulations of glyphosate, the park will nonetheless never deliberately apply any herbicide into water, or to plants growing in standing water, despite that fact that the label for such formulations allows the product to be applied in such a manner.

Special Protection Zones

Invasive plant control projects must meet the criteria and conditions of the Special Protection Zones listed in Table III.

Table III: Herbicide Use Special Protection Zones

Resource	Criteria or Conditions
Cultural Landscapes	▪ During the invasive plant control planning phase, project managers would consult with National Park Service resource specialists to ensure no adverse impact to cultural landscapes.
Schools, Playing Fields, Pools, Playgrounds, and Other Land Assignments	▪ On Mariposa County and Mariposa Unified School District land assignments and leases, and other land assignments in Yosemite National Park, the National Park Service would work with agencies and partners to achieve integrated pest management goals. The National Park Service would work with residents, parents, and other interested parties to develop 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 would not take place without prior notification of local residents.
Special-Status Plant Habitat	▪ During the invasive plant control planning phase, the National Park Service would determine whether special-status plant species are present in the area. If special-status plant species occur in the proximity of invasive plant treatment areas, botanists would develop site-specific mitigations to ensure no adverse effects on special-status plant species. If federally protected plant species are discovered in proposed work areas, the U.S. Fish and Wildlife Service would be consulted and no control activities would take place until that consultation is complete. No federally listed plants are currently documented in the park.
Special-Status Wildlife Habitat	▪ During the invasive plant control planning phase, biologists would determine whether invasive plant control measures would take place in likely habitat for special-status wildlife. If invasive plant control work would take place in likely special-status wildlife habitat, surveys would be performed before the park conducts invasive plant control measures. In the event that special-status wildlife occupy areas slated for treatment with herbicides, chemical treatments would not take place, and managers would develop site-specific mitigations to ensure no adverse effects on special-status wildlife.
Traditional Cultural Properties	▪ During the invasive plant control planning phase, managers would coordinate with park Historic Preservation Officer and Native American Liaison to consult associated American Indian Tribes to ensure that herbicides would not be used in traditional resource areas.

Table III: Herbicide Use Special Protection Zones	
Resource	Criteria or Conditions
Wetlands	▪ Herbicides would not be applied in standing water, within six feet of standing or flowing water, or on plants growing in water. ▪ Herbicides would only be used in seasonally flooded wetlands, and only during the dry phase of the year. ▪ Work crews would utilize only aquatic-approved formulations of glyphosate (with an R-11 surfactant) in wetlands. ▪ Work crews would not use terrestrial-approved herbicide formulations outside of upland areas.
Wild and Scenic River Corridors	▪ During the invasive plant control planning phase, program managers would fill out and submit Wild and Scenic River Invasive Plant Control Questionnaires (see Appendix J of the Invasive Plant Management Plan EA) to the Environmental Planning Branch for Yosemite National Park to determine whether Section 7 Determinations are necessary for the project. ▪ Work crews would not apply herbicides below the ordinary high-water mark of Wild and Scenic Rivers or their tributaries. ▪ Work crews would utilize only aquatic-approved formulations of glyphosate in wetlands.
Wilderness	▪ Program managers would consider the use of herbicides only if invasive plant populations pose ecosystem-level threats to Wilderness character and resources. ▪ Herbicide use must meet the conditions of the Wilderness Minimum Tool Requirements Analysis.

Public Involvement and Coordination

Public Involvement

Scoping

The National Park Service conducted public scoping for the Invasive Plant Management Plan during a 45-day period (January 1, 2005, to February 15, 2005). The planning team provided informational materials on the scoping period in a 2004 press release, the Yosemite National Park Electronic Newsletter (e-mailed to approximately 7,600 individuals, agencies, and organizations), the Gateway Partners Update, the Yosemite National Park Daily Report, the Mariposa Gazette, and the Yosemite National Park website. The park held two public meetings specifically to discuss the plan. One public meeting took place in El Portal on January 11, 2005, and one took place in Wawona on January 18, 2005. Both meetings had less than 25 attendees. The plan was also highlighted during the public scoping and through the planning period at the monthly Open House that takes place in Yosemite Valley. Members of the planning team were available to discuss the proposed plan at public open houses held monthly in Yosemite.

The public outreach called for in Section 106 of the National Historic Preservation Act was integrated with the NEPA scoping process, in accordance with the Yosemite Programmatic Agreement between the National Park Service at Yosemite, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation (NPS 1999).

The purpose of the informal public scoping meeting was to: (1) provide participants with an overview of existing conditions and the proposed action; (2) ask participants to identify key issues that should be analyzed during the environmental review and compliance process; and (3) provide an opportunity for participants to ask questions regarding project alternatives and the overall environmental review and compliance process.

The park received 46 comment letters during the public scoping process. Comments came from 29 individuals and the following agencies and organizations: American Indian Council of Mariposa, Californians for Alternatives to Toxics, Central Sierra Environmental Resource Center,

Central Sierra Partnership Against Weeds, Friends of Yosemite Valley, Golden Gate National Recreation Area, San Francisco Public Utilities, Sierra Club Yosemite Committee, Sierra National Forest, Sequoia National Park, Tuolumne Me-wuk Tribal Council, Upper Merced River Watershed Committee, Yosemite Area Audubon, and Wilderness Watch. The planning team derived and categorized a set of concern statements from the public comment letters. These concern statements, along with issues raised by National Park Service staff, provided input used in the alternatives development process and in the analysis presented in the Invasive Plant Management Plan EA. The following scoping comments and concerns were raised during public scoping and addressed in the EA:

- Prepare the Invasive Plant Management Plan in collaboration with citizen organizations and agencies with knowledge and experience in controlling invasive species.
- Ensure that the planning process is clear and includes public participation. Post all public comments on the Invasive Plant Management Plan to the Yosemite Planning Web page at www.nps.gov/yose/parkmgmt/planning.htm.
- Prepare a full environmental impact statement to analyze the impacts of the proposed Invasive Plant Management Plan.
- Directly involve Native American tribes with cultural ties to Yosemite National Park in invasive plant management.
- Develop management options through coordination with other divisions in the park.
- Include proposals for participation in prescribed fire planning.
- Require a public review and comment period each time an herbicide or biological control method is proposed for use.
- Develop a process to approve or reject the use of herbicides.
- Analyze the threat of invasive plants from outside park boundaries.
- Address the effects of proposed actions on the park soils.
- Consider restoring plant species that have been lost.
- Examine the relationship between park development activities and the invasion of non-native plants Include information about the invasion of exotic plants following road projects.
- Do not propose removal of non-native plants that are not invasive.
- Evaluate if native trees are invasive in some instances and should be controlled.
- Carefully examine the criteria for determining which plants are considered "non-native" and "undesirable."
- Examine each proposed invasive plant control treatment, and evaluate and weigh its positive and negative impacts.
- Employ invasive plant control techniques and strategies based on knowledge of the disturbance regime of each ecosystem.
- Ensure that methods used are based on the results of scientific research.
- Evaluate the effectiveness of herbicides as an invasive plant control treatment.
- Evaluate the need to use volunteers for invasive plant monitoring and control treatments.

- Evaluate the costs and chance for success of the varied invasive plant treatment methods.
- Call for the removal of the non-native invasive black locust (*Robinia pseudoacacia*) tree from the park.
- Consider all available invasive plant treatment options, except herbicides.
- Articulate and evaluate the strategies the park will use for prioritizing species.
- Pursue the control of invasive plants with the primary goal of allowing natural processes to prevail.
- Evaluate the potential for proposed actions to cause significant impacts on designated Wilderness and Wild and Scenic River Corridors.
- Protect Wilderness areas.
- Prescribe buffers from streams in the Tuolumne River watershed when herbicides are used.
- Evaluate the secondary, unintended consequences of herbicide use.
- Do not propose the massive, indiscriminate use of herbicides.
- Evaluate the potential unintended consequences of introducing non-native biological control agents into the park before considering them an invasive plant treatment option.
- Evaluate the effects of using fire for invasive plant treatment on the park and on regional air quality.
- Do not propose the use of clopyralid or triclopyr on vegetation that may subsequently be burned.

Based on public scoping comments and applicable federal law, regulations, and executive orders, the National Park Service determined that an environmental assessment (not an environmental impact statement) is the appropriate level of compliance for the Invasive Plant Management Plan. Public scoping comments, and issues raised by National Park Service staff, provided input used in the alternatives development process and in the analysis presented in the EA.

Public Comment

The Invasive Plant Management Plan EA was released for a 30-day public review period beginning June 13, 2008, and closing July 13, 2008. The public review period was announced in press releases, the Yosemite National Park Daily Report, the Mariposa Gazette, and the Yosemite National Park website. During this period, the National Park Service held an open house on June 25, 2008, to disseminate information and collect informal written comments on the Invasive Plant Management Plan and other projects. One public meeting specifically for the Invasive Plant Management Plan was held in El Portal on July 8, 2008. The park received eight comment letters, with 27 unique concerns, during the formal public comment period in the form of letters, emails, and comment forms.

The main issues raised were concerns on the safety of proposed herbicides and the need to refine mitigation for the upland habitat needs of the Yosemite toad. None of the comments received introduced substantive new information nor raised any issues not fully considered in the Invasive Plant Management Plan EA. No modifications to the proposed action were made as a result of comments, though mitigation measures were refined. Several of the public comments received provided additional nonsubstantive information or requested additional clarification. The

information has been documented in an Errata Sheet prepared as a technical supplement to the EA. As a result of public comment, additional mitigation measures were included for the protection of the Yosemite toad. Due to public concerns about the surfactant R-11 used in conjunction with herbicides, the plan was changed to include R-11 or a surfactant with less potential toxicity. This surfactant would be used only in wetland areas that have a dry phase, and during the dry phase. Non-native blackberry is an example of a plant that grows in wetlands with a dry phase.

U.S. Fish and Wildlife Service

Yosemite National Park consults with the U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office pursuant to Section 7 (a) (2) of the Endangered Species Act (U.S.C. 1531 et seq.). The National Park Service requested initiation of informal consultation with the U.S. Fish and Wildlife Service on July 3, 2008. At issue were the potential effects of the plan on the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)* and California red-legged frog (*Rana aurora draytonii*). Through informal consultation, the National Park Service agreed to include the following additional conservation measures into the plan (also see Mitigation section):

- No mechanical treatment or herbicide spraying will take place within 30 meters (100 feet) of elderberry shrubs during the flight season (typically occurring between mid-April and mid-June).
- No mechanical treatment or herbicide spraying will take place within 9 meters (30 feet) of any elderberry shrubs. Only manual removal of invasive plants will take place within 30 feet of any elderberry shrub.
- Pre-work surveys will be conducted in suitable frog habitat prior to mechanical control of vegetation or the application of herbicides. If any listed frogs are found, work will not take place until the U.S. Fish and Wildlife Service is contacted.

Based on the EA, the U.S. Fish and Wildlife Service determined that the Invasive Plant Management Plan for Yosemite National Park is not likely to adversely affect the valley elderberry longhorn beetle or California red-legged frog (U.S. Fish and Wildlife Service Letter, September 2, 2008, Reference Number 81420-2008-I-1674-1). No further consultation is required unless new information reveals effects of the proposed action that could affect listed species in a manner or to an extent not considered; or the plan is modified in a manner that causes an effect to the listed species that was not considered; or a new species or critical habitat is designated that may be affected by the proposed action (50 CFR 402.14).

Culturally Associated American Indian Tribes

The project scope includes areas with known traditional cultural properties and other traditional cultural resource use areas to which American Indians attach religious and cultural significance. Yosemite National Park is consulting with American Indian tribes 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[a] Paiute Tribe—to ensure no adverse effect on traditional cultural properties or traditional cultural use areas. Yosemite National Park staff presented the project

at tribal meetings on December 2, 2004, and January 27, 2005. The park received written comments from two tribes. One letter expressed satisfaction with the preferred alternative. The other letter encouraged the use of hand-pulling techniques and photo monitoring. The tribe also expressed the comment that if herbicides were used, they should be active no longer than 12 hours. All of these comments are consistent with the Selected Alternative. Information sharing and project planning will continue in consultation with the American Indian tribes throughout the implementation of the plan to ensure that any potential concerns are addressed accordingly and management recommendations are implemented as appropriate.

California State Historic Preservation Officer/Advisory Council On Historic Preservation

In accordance with the 1999 Yosemite Programmatic Agreement among Yosemite National Park, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation, professional staff from Yosemite National Park have determined that implementation of the Selected Alternative will have "no effect" on archeological or traditional cultural properties and "no adverse effect" on 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 Yosemite Programmatic Agreement.

Sierra and Stanislaus National Forests

The boundaries of Yosemite National Park are adjacent to five national forests. Representatives from the Sierra and Stanislaus National Forests participated in workshops to develop alternatives for the Invasive Plant Management Plan EA, served as consultants during the EA process, and provided informal review comments on the EA.

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Conclusion

Based on information contained in the Invasive Plant Management Plan EA as summarized above; the minimal nature 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 impacts nor impairment of park resources or values as a result of the Selected Alternative. In accordance with the 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 for Yosemite National Park Environmental Assessment* may be implemented as soon as practicable.

Recommended:

Superintendent, Yosemite National Park — Date 9/12/08

Approved:

Director, Pacific West Region, National Park Service — Date 9/16/08

Invasive Plant Management Plan for Yosemite National Park

Errata Sheets

This section provides a catalog of the corrections and changes made to the Invasive Plant Management Plan EA since its original release for comment. This Errata section must be attached to the Invasive Plant Management Plan EA to constitute a complete record of the analysis. These minor corrections are derived as a result of public comments received on the plan and 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 comment number is noted in brackets at the end of the text change, see the *Invasive Plant Management Plan for Yosemite National Park Summary of Public Comments and Responses* (NPS 2008).

Alternatives

Page II-13, Alternative 2 – Control Treatments, paragraph 1 has been revised as follows:

> In seasonally flooded wetlands (such as habitat for Himalayan blackberry), work crews would use aquatic-approved formulations of glyphosate with an R-11 surfactant, or an approved aquatic surfactant with lesser potential toxicity. ~~This is the only surfactant approved for aquatic use in California.~~

Page II -16, Table II-5 – Herbicide Special Protection Zones. The last bullet under Wetlands has been revised as follows:

- Work crews would utilize only aquatic-approved formulations of glyphosate (with an R-11 surfactant or an approved surfactant with lesser toxicity) in wetlands.

Page III-19, Environmental Consequences for Alternative 2 – Control, paragraph one has been revised to as follows:

> One herbicide, glyphosate, would be used in a formulation approved for aquatic application with an R-11 surfactant, or an approved aquatic surfactant with lesser potential toxicity.

Hydrology and Water Quality

Page III-10, Hydrology and Water Quality – Affected Environment, the last sentence in the second paragraph under has been revised to add the following text:

> Water quality is important to the health of habitats throughout the park, and the 2.4 million residents in the San Francisco Bay area who rely on water supplied from the Hetch Hetchy Reservoir.

Page II -16 Table II-5 – Herbicide Special Protection Zones. The first bullet under Wetlands has been revised as follows:

- Herbicides will not be applied in standing water, within ~~six~~ ten feet of standing or flowing water, or on plants growing in water.

Page III – 39, Paragraph 5, line 5, has been revised to add the following:

Herbicides will not be used within ~~six~~ ten feet of standing water.

Page L-1, Appendix L – Mitigation Measures Common to All Alternatives- Natural Resources, the following mitigation measure has been revised as follows:

- Work crews will not apply herbicides in standing water, or within ~~six~~ ten feet of standing water.

Page III-10, the last sentence in the second paragraph under Hydrology and Water Quality – Affected Environment, has been revised to add the following:

Water quality is important to the health of habitats throughout the park, and the 2.4 million residents in the San Francisco Bay area who rely on water supplied from the Hetch Hetchy Reservoir.

Special-status Wildlife

Page III-53, the last sentence in the third paragraph under Special-status Wildlife – Environmental Consequences of Alternative 2 – Early Detection and Rapid Response has been revised as follows:

Under Alternative 2, there would be a negligible ~~adverse~~ beneficial impact on the Yosemite toad and the Sierra yellow-legged frog.

Page III-54, the first sentence in the Conclusion under Special-status Wildlife has been revised as follows:

There would be a negligible ~~adverse~~ beneficial impact on the Yosemite toad and the Sierra yellow-legged frog.

Appendix L: Mitigation Measures Common to All Alternatives

Appendix L: Mitigation Measures Common to All Alternatives, the following text has been added to the mitigation section under Natural Resources:

- No mechanical treatment or herbicide spraying will take place within 100 feet of elderberry shrubs during the valley elderberry longhorn beetle flight season (typically occurring between mid-April and mid-June).
- No mechanical treatment or herbicide spraying will take place within 9 meters (30 feet) of any elderberry shrubs. Within 30 feet of any elderberry shrub, only manual removal of invasive plants will take place.
- Pre-work surveys will be conducted in suitable California red-legged frog habitat prior to mechanical control of vegetation or the application of herbicides. If any listed frogs are found, work will not take place until the U.S. Fish and Wildlife Service is contacted.

- Herbicides will not be applied within 2,500 feet (750 meters) of known breeding habitat for the Yosemite toad. Above 7,000 feet in elevation, if invasive plant eradication activities are planned to take place in appropriate habitat for the Yosemite toad in an area that has not been surveyed, surveys will take place prior to control activities. Surveys will take place within two months after Yosemite toad breeding times, when the toad is in its tadpole stage.

Appendix L: Mitigation Measures Common to All Alternatives, the following text has been added to the mitigation section under Biological Control:

- Only biological control agents approved by the U.S. Dept. of Agriculture Animal and Plant Health Inspection service will be used.
- When considering the use of a biological control agent, the program manager will confirm the use of the control agent is necessary and that all other treatment options are either not acceptable or not feasible.
- Before a biological control agent is released, the resource specialist will receive approval from the National Integrated Pest Management Coordinator to release the agent.
- The transport, handling, and release of biological control agents will be in accordance with all permit conditions. The park will report annual releases of biological control agents to the Regional Integrated Pest Management Coordinator.
- The number of biological control agents released will account for the size and density of the treatment area and the number of agents required to maintain a viable biological control agent population.
- Releases will be synchronized with the time period when the host plant is present. Biological control agents will be released at times of the day when they will not disperse from the treatment area.
- Surveys for biological control agents will be completed several times during the season to monitor biological control agents.

Archeological Resources

Page III-72, Archeological Resources – Affected Environment, the last sentence in the second paragraph has been revised as follows:

> Historical archeological sites provide important information that is not available in written records – e.g., cultural patterns typically omitted from historic literature (related to gender and ethnic groups), early building construction techniques, lifestyles and social systems of early settlers…

Page III-73, Archeological Resources – Affected Environment, the first sentence under Affected Environment has been revised to add the following text:

> Most of this work has focused on lower elevation developed areas and road corridors. To date, approximately 10% of the park has been surveyed for archeological material.

Page III-73, Archeological Resources – Environmental Consequences - Methodology, the third sentence under Type and Duration of Impact has been revised as follows:

> Adverse ~~impacts~~ effects on archeological resources could result from the manual or mechanical removal of plant material due to ground disturbance.

Page III-73, Archeological Resources – Environmental Consequences - Methodology, the following sentences have been added to the bottom of the first paragraph under Type and Duration of Impact:

> Use of herbicides has the potential to adversely affect archeological materials by adhering to, staining, hastening deterioration, or affecting one's ability to accurately identify them. Revealing cultural resources as a result of removing the vegetative cover may make the resources more susceptible to unauthorized collection, vandalism and some forms of erosion.

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