



IN REPLY REFER TO:  
L7615(YOSE-PM)

# United States Department of the Interior

## NATIONAL PARK SERVICE

Yosemite National Park  
P. O. Box 577  
Yosemite, California 95389

### Memorandum

**To:** Steve Thompson, Project Manager, Yosemite National Park

**From:** Superintendent, Yosemite National Park

**Subject:** NEPA and NHPA Clearance: 2012-012 Yosemite and Poopenaut Valley Bullfrog Eradication (40361)

The Executive Leadership Team has reviewed the proposed project/action and completed its environmental assessment documentation, and we have determined that there:

- Will not be any effect on threatened, endangered, or rare species and/or their critical habitat.
- Will not be any effect on historical, cultural, or archeological resources.
- Will not be serious or long-term undesirable environmental or visual effects.

The subject proposed project, therefore, is now cleared for all NEPA and NHPA compliance requirements as presented above. Project plans and specifications are approved and construction and/or project implementation can commence.

For the proposed project actions to be within compliance requirements during construction and/or project implementation, the following mitigations must be adhered to:

- No mitigations identified.

For complete compliance information see PEPC Project 40361.

//Tom Medema//Acting  
Don L. Neubacher

Enclosure (with attachments)

cc: Statutory Compliance File

*The signed original of this document is on file at the  
Environmental Planning and Compliance Office in  
Yosemite National Park.*



## Categorical Exclusion Form

**Project:** 2012-012 Yosemite and Poopenaut Valley Bullfrog Eradication

**PEPC Project Number:** 40361

**Project Description:**

This project will complete the eradication of non-native bullfrogs from Yosemite and Poopenaut Valley through removal of adults, tadpoles, and egg masses over a three-year period beginning in 2012. This effort builds upon funded efforts in 2005-2006 which removed a vast majority of the frogs, and 2007-2011 base-funded efforts to prevent resurgence of the bullfrogs. During the earlier funded period, approximately 3,500 bullfrogs were removed, along with thousands of tadpoles and hundreds of egg masses. Efforts in 2007-2011 indicate that there may be fewer than 100 bullfrogs left. Despite this relatively low number, it is expected that complete removal will require concentrated efforts to locate and catch the remaining individuals, and to prevent reproduction through removal of egg masses.

Bullfrogs (*Rana catesbeiana*) are a non-native species in the western United States, including Yosemite National Park. They are highly carnivorous, opportunistic feeders that eat anything they can get their mouths around, including: insects, reptiles, and small birds and mammals, including bats. Bullfrogs currently infest and breed in several ponds within Yosemite Valley.

Based on the number of egg masses still appearing at breeding sites, we estimate that there are approximately 50 adult females still present, with likely fewer adult males. The estimate of fewer males is based on the 2007-2011 period of efforts, in which 56 males and 12 females were removed. The males are more conspicuous, due to their loud calls, and tend to reside in the breeding habitat, whereas, females do not call, and tend to be more transient, with most coming to the breeding habitat just long enough to mate and lay eggs.

Isolated individual bullfrogs are also known to be scattered along the Merced River but breeding there is very rare, and tadpole survival is unlikely. Nonetheless, all bullfrogs must be located and removed from Yosemite Valley to prevent re-colonization of the breeding habitat, which are warm ponds that become separated from river flows by early summer, but stay filled year-round.

The proposed eradication efforts would be focused over a three-year period with two primary actions: (1) removal of egg masses in the spring, and (2) killing of adult frogs and tadpoles in the spring, summer, and early fall. In Yosemite Valley, frogs congregate at the relatively small and few breeding sites: egg masses can be found, identified, and removed, and adults would be killed through the use of gigs, traps, air guns (using non-lead ammunition), hand-grab, and nets. If tadpoles hatch, we will remove them with nets, concentrating on late summer when water levels are lowest and tadpoles are concentrated (bullfrog tadpoles require two years to metamorphose into adults at the elevation of Yosemite Valley). Removal of adult frogs would occur primarily at night, when bright headlamps can be used to dazzle them, allowing close approach for capture (using hand-grab, spears, pellet guns). Removal of egg masses and tadpoles would occur primarily during daylight hours when they would be most visible.

Repeated visits to the breeding ponds and locations of scattered individual along the Merced River throughout the summer would maximize the number of frogs and tadpoles removed. Past efforts in 2005-2011 have resulted in an estimated >95% reduction in the bullfrog population in Yosemite Valley. Further application of these methods should result in complete elimination of bullfrogs from Yosemite Valley.

**Project Locations:**

Mariposa County, CA

**Mitigations:**

- No mitigations identified.

**Describe the category used to exclude action from further NEPA analysis and indicate the number of the category (see Section 3-4 of DO-12):**

E.2 Restoration of noncontroversial native species into suitable habitats within their historic range and elimination of exotic species.

**On the basis of the environmental impact information in the statutory compliance file, with which I am familiar, I am categorically excluding the described project from further NEPA analysis. No exceptional circumstances (e.g. all boxes in the ESF are marked "no") or conditions in Section 3-6 apply, and the action is fully described in Section 3-4 of DO-12.**

//Tom Medema//  
Don L. Neubacher

//8/9/12//  
Date

*The signed original of this document is on file at the Environmental Planning and Compliance Office in Yosemite National Park.*



## ENVIRONMENTAL SCREENING FORM (ESF)

### DO-12 APPENDIX 1

Date Form Initiated: 07/03/2012

Updated May 2007 - per 2004 Departmental Manual revisions and proposed Director's Order 12 changes

#### A. PROJECT INFORMATION

**Park Name:** Yosemite National Park  
**Project Title:** 2012-012 Yosemite and Poopenaut Valley Bullfrog Eradication  
**PEPC Project Number:** 40361  
**PMIS Number:** 182811  
**Project Type:** Non-native Species Removal (OTHER)  
**Project Location:**  
**County, State:** Mariposa, California **District:** Valley  
**Project Leader:** Steve Thompson

Is project a hot topic (controversial or sensitive issues that should be brought to attention of Regional Director)? No

#### B. RESOURCE EFFECTS TO CONSIDER:

Identify potential effects to the following physical, natural, or cultural resources	No Effect	Negligible Effects	Minor Effects	Exceeds Minor Effects	Data Needed to Determine/Notes
1. Geologic resources – soils, bedrock, streambeds, etc.	No				
2. From geohazards	No				
3. Air quality	No				
4. Soundscapes	No				
5. Water quality or quantity	No				
6. Streamflow characteristics	No				

<b>Identify potential effects to the following physical, natural, or cultural resources</b>	<b>No Effect</b>	<b>Negligible Effects</b>	<b>Minor Effects</b>	<b>Exceeds Minor Effects</b>	<b>Data Needed to Determine/Notes</b>
7. Marine or estuarine resources	No				
8. Floodplains or wetlands	No				
9. Land use, including occupancy, income, values, ownership, type of use	No				
10. Rare or unusual vegetation – old growth timber, riparian, alpine	No				
11. Species of special concern (plant or animal; state or federal listed or proposed for listing) or their habitat	No				
12. Unique ecosystems, biosphere reserves, World Heritage Sites	No				
13. Unique or important wildlife or wildlife habitat	No				This project has beneficial impacts to native species by eradicating the invasive bullfrogs.
14. Unique or important fish or fish habitat	No				
15. Introduce or promote non-native species (plant or animal)	No				
16. Recreation resources, including supply, demand, visitation,	No				

<b>Identify potential effects to the following physical, natural, or cultural resources</b>	<b>No Effect</b>	<b>Negligible Effects</b>	<b>Minor Effects</b>	<b>Exceeds Minor Effects</b>	<b>Data Needed to Determine/Notes</b>
activities, etc.					
17. Visitor experience, aesthetic resources	No				
18. Archeological resources	No				
19. Prehistoric/historic structure	No				
20. Cultural landscapes	No				
21. Ethnographic resources	No				
22. Museum collections (objects, specimens, and archival and manuscript collections)	No				
23. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure	No				
24. Minority and low income populations, ethnography, size, migration patterns, etc.	No				
25. Energy resources	No				
26. Other agency or tribal land use plans or policies	No				

<b>Identify potential effects to the following physical, natural, or cultural resources</b>	<b>No Effect</b>	<b>Negligible Effects</b>	<b>Minor Effects</b>	<b>Exceeds Minor Effects</b>	<b>Data Needed to Determine/Notes</b>
27. Resource, including energy, conservation potential, sustainability	No				
28. Urban quality, gateway communities, etc.	No				
29. Long-term management of resources or land/resource productivity	No				
30. Other important environment resources (e.g. geothermal, paleontological resources)?	No				

### **C. MANDATORY CRITERIA**

<b>Mandatory Criteria: If implemented, would the proposal:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comment or Data Needed to Determine</b>
A. Have significant impacts on public health or safety?		No		
B. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas?		No		

<b>Mandatory Criteria: If implemented, would the proposal:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comment or Data Needed to Determine</b>
C. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA section 102(2)(E))?		No		
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?		No		
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?		No		
F. Have a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects?		No		
G. Have significant impacts on properties listed or eligible for listing on the National Register of Historic Places, as determined by either the bureau or office?		No		
H. Have significant impacts on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?		No		
I. Violate a federal law, or a state, local, or tribal law or requirement imposed for the protection of the environment?		No		
J. Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898)?		No		
K. Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or significantly adversely affect the physical		No		

<b>Mandatory Criteria: If implemented, would the proposal:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comment or Data Needed to Determine</b>
integrity of such sacred sites (Executive Order 13007)?				
L. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?		No		

#### **D. OTHER INFORMATION**

1. Are personnel preparing this form familiar with the site? Yes
- 1.A. Did personnel conduct a site visit? No
2. Is the project in an approved plan such as a General Management Plan or an Implementation Plan with an accompanying NEPA document? No
3. Are there any interested or affected agencies or parties? No
4. Has consultation with all affected agencies or tribes been completed? N/A
5. Are there any connected, cumulative, or similar actions as part of the proposed action? (*e.g., other development projects in area or identified in GMP, adequate/available utilities to accomplish project*) No

#### **E. INTERDISCIPLINARY TEAM SIGNATORIES**

<u><b>Interdisciplinary Team</b></u>	<u><b>Field of Expertise</b></u>
Don L. Neubacher	Superintendent
Woody Smeck	Deputy Superintendent
Michael Gauthier	Chief of Staff
Kathleen Morse	Chief of Planning
Randy Fong	Chief of Project Management
Teri Austin	Chief of Administration Management
Ed Walls	Chief of Facilities Management
Linda C. Mazzu	Chief of Resources Management & Science
Tara Riggs	Acting Chief of Business and Revenue Management
Tom Medema	Chief of Interpretation and Education
Charles Cuvelier	Chief of Visitor and Resource Protection
Steve Thompson	Project Leader
Ann Roberts	Acting Environmental Planning and Compliance Program Manager
Renea Kennece	NEPA Specialist

#### **F. SUPERVISORY SIGNATORY**

***Based on the environmental impact information contained in the statutory compliance file and in this environmental screening form, environmental documentation for this stage of the subject project is complete.***

**Recommended:**

Compliance Specialists	Date
<u>//Renea Kennec//</u> Compliance Specialist – Renea Kennec	<u>//7/27/12//</u>
<u>//Ann Roberts//</u> Acting Compliance Program Manager – Ann Roberts	<u>//7/31/12//</u>
<u>//Michael Wichmann//</u> Chief, Project Management – Randy Fong	<u>//8/6/12//</u>

**Approved:**

Superintendent	Date
<u>//Tom Medema//Acting</u> Don L. Neubacher	<u>//8/9/12//</u>

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## PARK ESF ADDENDUM

Today's Date: July 18, 2012

### PROJECT INFORMATION

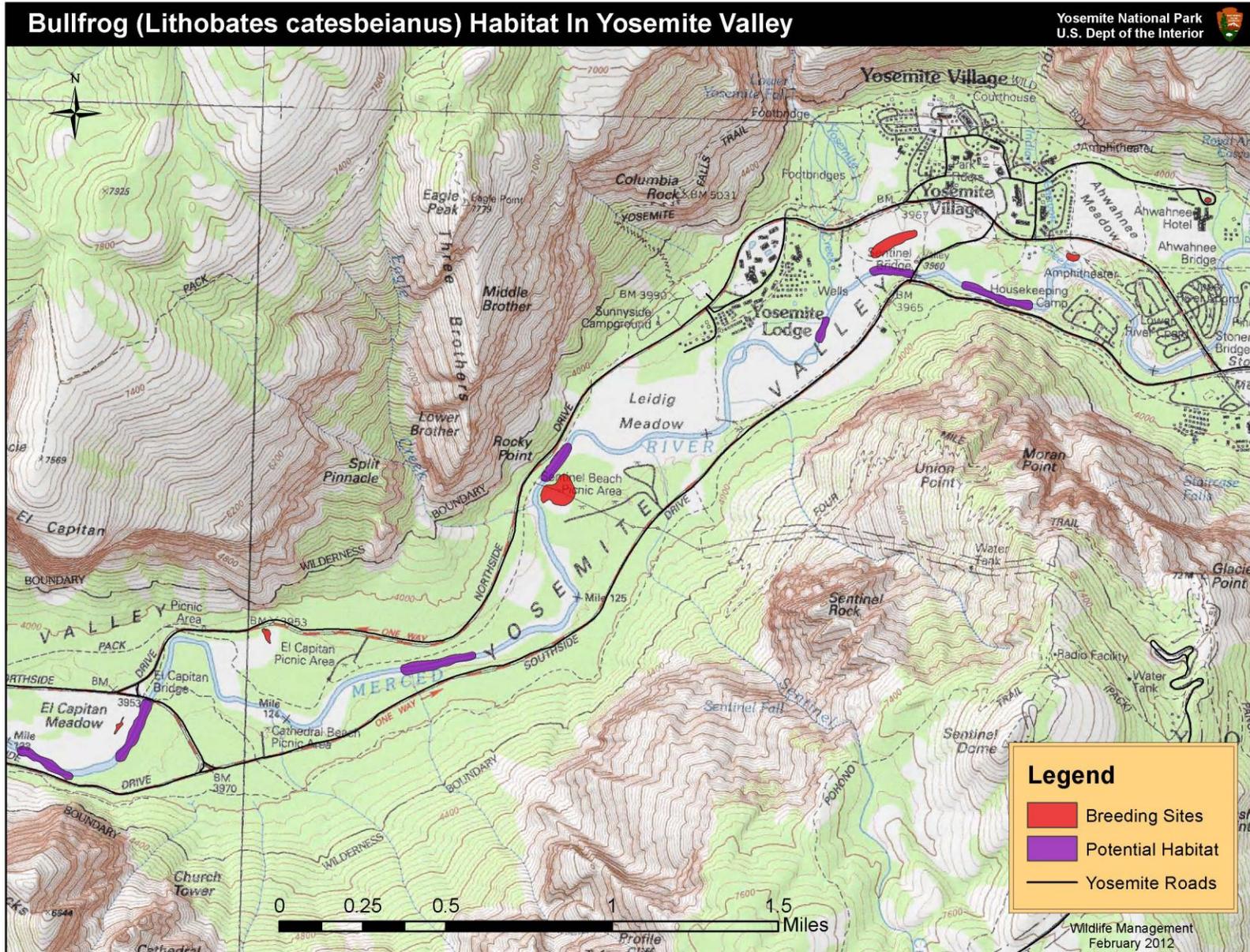
**Park Name:** Yosemite National Park  
**Project Title:** 2012-012 Yosemite and Poopenaut Valley Bullfrog Eradication  
**PEPC Project Number:** 40361

**Project Type:** Non-native Species Removal (OTHER)  
**Project Location:**  
**County, State:** Mariposa, California **District:** Valley  
**Project Leader:** Steve Thompson

### PARK ESF ADDENDUM QUESTIONS & ANSWERS

ESF Addendum Questions	Yes	No	N/A	Data Needed to Determine/Notes
<b>SPECIAL STATUS SPECIES CHECKLIST</b>				
Listed or proposed threatened or endangered species (Federal or State)?	Yes			This project could allow the return of the California red-legged frog and foothill yellow-legged frog, although more records need to be found to confirm the historic presence of these species.
Species of special concern (Federal or State)?		No		
Park rare plants or vegetation?		No		
Potential habitat for any special-status species listed above?	Yes			
<b>NATIONAL HISTORIC PRESERVATION ACT CHECKLIST</b>				
Entail ground disturbance?		No		
Are any archeological or ethnographic sites located within the area of potential effect?		No		
Entail alteration of a historic structure or cultural landscape?		No		
Has a National Register form been completed?		No		
Are there any structures on the park's List of Classified Structures in the area of potential effect?		No		

<b>ESF Addendum Questions</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Data Needed to Determine/Notes</b>
<b>WILD AND SCENIC RIVERS ACT CHECKLIST</b>				
Fall within a wild and scenic river corridor?	Yes			Most activities would occur in or adjacent to Merced or Tuolumne River, but actions would be restorative.
Fall within the bed and banks AND will affect the free-flow of the river?		No		
Have the possibility of affecting water quality of the area?		No		
Remain consistent with its river segment classification?		No		
Fall on a tributary of a Wild and Scenic River?		No		
Will the project encroach or intrude upon the Wild and Scenic River corridor?		No		
Will the project unreasonably diminish scenic, recreational, or fish and wildlife values?		No		
Consistent with the provisions in the Merced River Plan Settlement Agreement?	Yes			
<b>WILDERNESS ACT CHECKLIST</b>				
Within designated Wilderness?		No		
Within a Potential Wilderness Addition?		No		



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## Implementation Plan

### For Eradication of Bullfrogs in Yosemite Valley

#### Section 1.

**Project Title:** Eradication of Bullfrogs in Yosemite Valley

**Project PMIS#:** 182811

National Park Service Management Policies (2006)

Natural Resource Management 4.4.4.2: Removal of Exotic Species Already Present:

*All exotic plant and animal species that are not maintained to meet an identified park purpose will be managed – up to and including eradication, ...*

**GPRA Goal:**

1a. *Natural and cultural resources and associated values are protected, restored and maintained in good condition and managed within their broader ecosystem and cultural context.*

1a1. *“...containment of invasive ... animal species.”*

**Principle Investigators:** Steve Thompson, Wildlife Biologist  
(209) 379-1437

Heather McKenny, Aquatic Ecologist  
(209) 379-1438

**Park Unit Lead:** Yosemite Resources Management and Science

**Natural Resources Program Center Project Coordinator:** \_\_\_\_\_

#### Section 2. Table of Contents

Section 3.

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    - (6a) Final Completion Reports
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  - 7. Quality Assurance, Quality Control, and Data Quality Objectives

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Appendix: Literature Cited

### **Section 3.**

#### Abstract

This project will complete the eradication of non-native bullfrogs from Yosemite Valley through removal of adults, tadpoles, and egg masses over a three-year period beginning in 2012. This effort builds upon funded efforts in 2006-2007 which removed a vast majority of the frogs, and 2007-2011 base-funded efforts to prevent resurgence of the bullfrogs. During the earlier funded period, approximately 2,500 bullfrogs were removed, along with thousands of tadpoles and hundreds of egg masses. Based on the number of egg masses still appearing at breeding sites, we estimate that there are approximately 50 adult females still present, with likely fewer adult males. Despite this relatively low number, it is expected that complete removal will require concentrated efforts to locate and catch the last individuals, and to prevent reproduction through removal of egg masses. The reason removal of bullfrogs is necessary is because they are voracious predators of native species including other amphibians, snakes, hatchling turtles, small birds and the young of larger birds, such as ducks, small mammals, and many species of invertebrates. Bullfrogs are thought to be the cause of extinction of two frog species native to Yosemite Valley: the California red-legged frog and the foothill yellow-legged frog.

### **Section 4. Introduction**

#### (4a) Problem Statement

Bullfrogs (*Rana catesbeiana*) are a non-native species in the western U.S., including Yosemite National Park. They are highly carnivorous, opportunistic feeders that eat anything they can get their mouths around, including: insects, reptiles, and small birds and mammals – including bats. Bullfrogs currently infest several ponds within Yosemite Valley, where they breed, and isolated

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individuals along the Merced River. Their presence is partly responsible for the extirpation of a federally-threatened species, California red-legged frog (*Rana aurora draytonii*) and the California Species of Concern foothill yellow-legged frog (*Rana boylei*). Bullfrogs have been documented as responsible for the elimination of native anurans in other areas (Moyle 1973, Hayes and Jennings 1986, Kiesecker and Blaustein 1998, Rosen and Schwalbe 1995, Kats and Ferrer 2003). They are currently listed in the top 100 of the world's worst invasive alien species (IUCN-World Conservation Union: [www.iucn.org](http://www.iucn.org); Invasive Species Specialist Group: [www.issg.org](http://www.issg.org)).

Bullfrogs currently are confined to two relatively small insular areas in Yosemite National Park: Yosemite Valley and the region of Miguel Meadows, north of Hetch Hetchy reservoir. They are believed to be having serious ecological effects in those areas. There is great concern that they may spread more widely in the park unless they are eradicated. Based on the number of egg masses still appearing at breeding sites, we estimate that there are approximately 50 adult females still present, with likely fewer adult males. The estimate of fewer males is based on the 2007-2011 period of efforts, in which 56 males and 12 females were removed. The males are more conspicuous, due to their loud calls, and tend to reside in the breeding habitat, whereas, females do not call, and tend to be more transient, with most coming to the breeding habitat just long enough to mate and lay eggs. It is believed the females retreat to other habitats, such as the Merced River, to avoid harassment or even cannibalism by the larger adult males.

Isolated individual bullfrogs are also known to be scattered along the Merced River. There has, however, only been one known case of bullfrogs breeding in the river. In the late summer of a drought year in 2009 approximately a dozen bullfrog tadpoles were seen in the river near the confluence with Cascade Creek. It is unlikely that any tadpoles hatched in the Merced River reach maturity, because at the elevation of Yosemite Valley (~4,000 feet) the tadpoles take two years from hatch to metamorphosis, and the swift, cold, and usually prolonged flows of the river probably do not allow tadpoles to reach maturity. Nonetheless, all bullfrogs must be located and removed from Yosemite Valley to prevent recolonization of the breeding habitat, which are warm ponds that become separated from river flows by early summer, but stay filled year-round.

Other park-rare species that may be negatively impacted by their presence include the following: federally threatened Valley elderberry longhorn beetle (*Desmoscerus californicus californicus*), Northwestern pond turtle (*Clemmys marmorata marmorata*), Southwestern pond turtle (*Clemmys marmorata pallida*), Palid Bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii townsendii*), Spotted bat (*Euderma maculatum*), Western red bat (*Lasiurus blossevillii*), and Greater western mastiff bat (*Eumops perotis californicus*).

This project will complete the eradication of bullfrogs from Yosemite Valley through concentrated effort, with possible subsequent reintroduction of the native California red-legged frog and foothill yellow-legged frog into this habitat. Efforts from 2005 through 2011 have removed a vast majority of the bullfrogs, but the last 5 years of work has been accomplished with

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a total of about one pay period per year spread through the summers, and concentrated mainly on removal of egg masses to prevent reproduction, with opportunistic removal of frogs.

(4b) Background

When bullfrogs were introduced to Yosemite National Park is unknown. Bullfrogs currently are confined to two relatively small insular areas in Yosemite National Park: Yosemite Valley and the region of Miguel Meadows, north of Hetch Hetchy reservoir. This project will attempt to eradicate bullfrogs from the Yosemite Valley. Bullfrogs are present in most aquatic habitats within the valley, including the Merced River, but suitable breeding habitat is restricted to approximately 10 small ponds where the water reaches warm temperatures in spring and summer. These ponds are close to the Merced River, and a majority of the adult frogs in the river occur adjacent to the ponds, and probably spend a considerable amount of time in the ponds. Within Yosemite Valley, this pond-habitat is scarce, productive, and important to a wide range of native aquatic and terrestrial species; an importance that has been impaired by the presence of bullfrogs.

The California red-legged frog and the foothill yellow-legged frog were once found in Yosemite Valley (National Park Service 2000), but are now apparently extirpated due to loss of habitat, predation by bullfrogs and, perhaps, other factors. It is likely that other native species have been completely lost from these habitats and are unlikely to recover as long as bullfrogs are present, although few data exist to document these changes.

Ironically, efforts to restore the natural hydrologic regime in meadow and wetland areas in Yosemite Valley (National Park Service 2000a, National Park Service 2000b) have likely resulted in a substantial increase in breeding habitat for bullfrogs. It is therefore imperative that bullfrogs are eradicated from Yosemite Valley before meadow restoration efforts proceed much further.

(4c) Specific Objectives to be Addressed:

Management Objectives

*To completely eradicate bullfrogs from Yosemite Valley.* The habitats they occupy are rare and productive. The warm-water ponds that have been taken over by bullfrogs are also important to a wide range of native species. In addition, current efforts to restore meadow and wetland habitats in Yosemite Valley will be seriously compromised if the present distribution of bullfrog expands to encompass these newly restored areas and displace native species from these habitats as well.

Questions to be Answered

*(1) Whether a combination of eradication techniques can be successfully applied to remove bullfrogs from Yosemite Valley Ponds over a three-year period?*

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Although bullfrogs can be a difficult species to eradicate, the areas they occupy in Yosemite are at a relatively high elevation for the species, and their breeding habitat is small and well defined. The largest breeding pond measures approximately 50 square meters surface area, and a maximum depth of 1.5 m. These factors – coupled with past eradication efforts, natural mortality, low recruitment, and relatively small areas of concentration – will boost effectiveness of eradication efforts and chances of success. We realize that success of our program would be precedent-setting.

(2) *Can of methods used in Yosemite be applied to other bullfrog infestations?* The situation in Yosemite Valley is unusual in that reinfestation is unlikely due to the absence of other bullfrog populations adjacent to the Valley. While effort-intensive, we expect that our unusual success could be used in similar situations of isolated bullfrog population, or to reduce bullfrogs to a manageable level to allow at least partial return of native species. The answer to this question would come from application of our methods in other bullfrog eradication efforts.

(4d) Environmental Planning:

Bullfrog eradication would be carried out under *Interim Guidance - Director's Order 12 Categorical Exclusions... 3.3E For Which a Record is Needed:*

4. *Removal of individual members of a non-threatened/endangered species or populations of pests and exotic plants that pose an imminent danger to visitors or an immediate threat to park resources.*

Although a majority of the bullfrog eradication will occur close to the Merced River, no changes to the habitat would occur, and none of the Outstandingly Remarkable Values of the Draft Merced Wild and Scenic River Plan now under development would be adversely affected. In fact, the eradication of bullfrogs from Yosemite Valley would go far in recovery of riparian, meadow, and wetland habitats, by allowing the wildlife species in these communities to return more fully

(4e) Principal Project Mangers:

Steve Thompson, Wildlife Biologist/ Heather McKenny, Aquatic Ecologist

Yosemite National Park

Relevant Outside Consultants (who have performed/researched bullfrog eradication):

R. Knapp, U.C. Santa Barbara  
C. Schwalbe, USGS, Tucson  
E. Ervin, USGS San Diego  
R. Fisher, USGS San Diego

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## 5. Study/Implementation Plan

### (5a.1) Approach and Methods:

We will be using methods that have proven effective for other biologists engaged in bullfrog eradication. In addition, because eradication can be painstaking, we will look to refine current eradication techniques as well as employ new methodologies. We have consulted with guidelines published by experts in the field of euthanasia in order to choose the most humane, ethical methods for eradication (American Society of Ichthyologists and Herpetologists, et al. 2003, Cooper et al. 1989, Burns 1995, American Veterinary Medical Association 2000).

The proposed eradication efforts would focus – over a three-year period (2012-2013)– on two primary actions: (1) removal of egg masses in the spring, and (2) killing of adult frogs and tadpoles in the spring, summer, and early fall. In Yosemite Valley, frogs congregate at the relatively small and few breeding sites: egg masses can be found, identified, and removed, and adults would be killed through the use of gigs, traps, air guns (using non-lead ammunition), hand-grab, and nets. If tadpoles hatch, we will remove them with nets, concentrating on late summer when water levels are lowest and tadpoles are concentrated (bullfrog tadpoles require two years to metamorphose into adults at the elevation of Yosemite Valley). Removal of adult frogs would occur primarily at night, when bright headlamps can be used to dazzle them, allowing close approach for capture (using hand-grab, spears, pellet guns. Removal of egg masses and tadpoles would occur primarily during daylight hours when they would be most visible. Experiments would also be conducted to determine the effectiveness of funnel and labyrinth traps, and recorded calls as attractants.

One site, the pond at the Ahwahnee, is an artificial impoundment which can be drained to ensure that bullfrogs never become established there again. In 2007, it was drained and tons of vegetation and sediment were removed. The pond was resealed and filled. The concessionaire will continue to manage it as an artificial pond, with annual draining and cleaning in the fall. Since the removal of bullfrogs, it has become a breeding area for Pacific treefrogs (*Pseudacris regilla*), and many species of native invertebrates.

Repeated visits to the breeding ponds throughout the summer would maximize the number of frogs and tadpoles removed. Past efforts in 2005-2011 have resulted in an estimate >95% reduction in the bullfrog population in Yosemite Valley. Further application of these methods should result in complete elimination of bullfrogs from the nuclei of reproduction. Also, the full length of the Merced River will be surveyed to detect isolated individuals, and remove them. It is expected that continued surveys would become an annual activity, to detect any missed frogs, or ones subsequently introduced again by humans. Such efforts are beyond the scope of this project, and would fall under the category of regular management, as efforts 2008-2011 prevented reproduction, and prevented resurgence of the population.

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Experience gained through this project will be communicated to other biologists through reports, presentations, and papers.

(5a.2) Data Analysis and Meta Data:

The population unit as described above consists of bullfrogs/progeny occurring in ~10 ponds within Yosemite Valley, with each pond representing a single unit. We will systematically remove all bullfrogs/progeny encountered.

Data collected will be quantitative counts of adults, individual egg masses, and tadpoles removed on a per-effort basis, across years, for each pond (including date). Therefore, statistical analysis will be minimal and reflect numbers and proportions of individuals (animal or egg mass) removed over time.

We will record size (snout- to-vent length to the nearest 0.5 cm).

and sex (male, female, or unknown) of adult and subadult bullfrogs removed from the population.

(5b) Tasks, Organization, and Schedule – 2012 - 2014:

*Project Planning/Equipment Procurement:* March – May; by existing Wildlife Management Staff (much of the equipment has already been acquired, in support of the 2006-2007 project, and subsequent, lower-intensity efforts)

*Training of project-hired personnel:* early July; by existing Wildlife Management Staff

*Removal of egg masses and adults:* June – Early July; by existing Wildlife Management Staff (June) and project-hired personnel (July forward).

*Removal of adults and tadpoles:* June – September; by project-hired personnel.

*Data analysis and report writing:* October – December; project managers

## **6. Deliverables and other Reporting Requirements**

(6a) Annual Reports will be completed and submitted to Biological Resources Management Division, WASO (**Denver? Call Jay**) by December 31 of each calendar year.

(6b) Final Completion Report: A final report written will be prepared and sent to Biological Resources Management Division, WASO, no later than December 31, 2014

(6c) Deliverables by Entities other than the Park: None

## **Quality Control**

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The assessment of field conditions will include opportunistic recording of animal species occurring at the wetlands where bullfrog eradication takes place. Animal species will be identified by field technicians hired for the project, and by Yosemite National Park's wildlife biologist and aquatic ecologist.

Eradication efforts may vary among breeding sites, depending upon conditions that make some techniques more effective than others. Two field technicians will work as a team, at each wetland area, to maintain operational safety, and facilitate data collection.

The Project Manager(s) will regularly review collected data and accompany the crew into the field at regular intervals to ensure that the most effective frog removal techniques are being used in a safe manner, and that data quality control is maintained.

## **8. Budget-Cost:**

### *Year 1:*

Biological Science Technicians: (2 for 3 mo.)= \$19,617

Aquatic Ecologist Field Supervisor: 2 pp = \$6,873

Vehicle Costs: 3 mo. @ \$1000/mo. = \$3,000

Equipment: = \$2,510

Total = \$32,000

### *Year 2:*

Biological Science Technicians GS-05 (2 for 3 mo.) = \$20,559

Aquatic Ecologist Field Supervisor GS-11: 2 pp = \$7,216

Vehicle Costs: 3 mo @ \$1,200/mo = \$3,600

Equipment = \$1,625

Total = \$33,000

### *Year 3:*

Biological Science Technicians: (2 for 3 mo.)= \$21,789

Aquatic Ecologist Field Supervisor GS-11: 2 pp = \$7,711

Vehicle Costs: 3 mo. @ \$1,500. = \$4,500

Total = \$34,000

Project Total = \$99,000

## **Appendix A. Literature Cited**

American Association of Veterinary Medicine. 2001. 2000 Report of the AVMA Panel on Euthanasia. JAVMA, Vol. 218(5): 669-696.

Burns, R., DVM. 1995. Considerations in the Euthanasia of Reptiles, Amphibians, and Fish. *In* 1995 Proceedings of Joint Conference AAZV/WDA/AAWV. pp. 243-249.

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- Cooper, J.E., R. Ewbank, C. Platt, and C. Warwick. 1989. Euthanasia of Reptiles and Amphibians. Report of a Joint UFAW/WSPA Working Party. Universities Federation for Animal Welfare and World Society for the Protection of Animals. London. 35 pp.
- Hayes, M.P. and M.R. Jennings. 1986. Decline of ranid frog species in western North America: are bullfrogs (*Rana catesbeiana*) responsible? *Journal of Herpetology* 20: 490-509.
- Kats, L.B, and R.P Ferrer. 2003. Alien predators and amphibian declines: review of two decades of science and the transition to conservation. *Diversity & Distributions*, Blackwell Synergy. Volume 9(2): 99.
- Moyle, P.B. 1973. Effects of introduced bullfrogs, *Rana catesbeiana*, on the native frogs of the San Joaquin Valley, California. *Copeia* 1973 (1): 18-22.
- National Park Service. 2000a. Yosemite Valley Plan: Supplemental Environmental Impact Statement. National Park Service. Yosemite National Park. United States Department of Interior.
- National Park Service. 2000b. Merced Wild and Scenic River Comprehensive Management Plan and Final Environmental Impact Statement. National Park Service. Yosemite National Park. United States Department of Interior.
- Rosen, P.C and C.R. Schwalbe. 1995. Bullfrogs: Introduced Predators in Southwestern United States. *In: Our living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems*. U.S. Department of the Interior, Washington. pp. 452-454.
- American Society of Ichthyologists and Herpetologists, The Herpetologists League, and Society for the Study of Amphibians and Reptiles. 2003. Guidelines for the Use of Live Amphibians and Reptiles in Field Research. [available only online] 14 pp. [www.asih.org/pubs/herpcoll.html](http://www.asih.org/pubs/herpcoll.html)



# ASSESSMENT OF ACTIONS HAVING AN EFFECT ON CULTURAL RESOURCES

## A. DESCRIPTION OF UNDERTAKING

1. **Park:** Yosemite National Park

### 2. **Project Description:**

**Project Name:** 2012-012 Yosemite and Poopenaut Valley Bullfrog Eradication

**Prepared by:** Renea Kennec

**Date Prepared:** 07/27/2012

**Telephone:** 209-379-1038

**PEPC Project Number:** 40361

**Area of potential effects (as defined in 36 CFR 800.16[d])**

### 3. **Has the area of potential effects been surveyed to identify cultural resources?**

   No

X Yes

Source or reference: Yosemite Valley Historic District; Yosemite Archeological District.

Check here if no known cultural resources will be affected. (If this is because area has been disturbed, please explain or attach additional information to show the disturbance was so extensive as to preclude intact

X cultural deposits.)

### 4. **Potentially Affected Resource(s):**

### 5. **The proposed action will: (check as many as apply)**

   No Destroy, remove, or alter features/elements from a historic structure

   No Replace historic features/elements in kind

   No Add non-historic features/elements to a historic structure

   Alter or remove features/elements of a historic setting or environment  
   No (inc. terrain)

   Add non-historic features/elements (inc. visual, audible, or atmospheric)  
   No to a historic setting or cultural landscape

   No Disturb, destroy, or make archeological resources inaccessible

   No Disturb, destroy, or make ethnographic resources inaccessible

   No Potentially affect presently unidentified cultural resources

No Begin or contribute to deterioration of historic features, terrain, setting,  
landscape elements, or archeological or ethnographic resources

No Involve a real property transaction (exchange, sale, or lease of land or  
structures)

       Other (please  
specify): \_\_\_\_\_

#### 6. Supporting Study Data:

(Attach if feasible; if action is in a plan, EA or EIS, give name and project or page number.)

#### B. REVIEWS BY CULTURAL RESOURCE SPECIALISTS

The park 106 coordinator requested review by the park's cultural resource specialist/advisors as indicated by check-off boxes or as follows:

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Archeologist

Name: Laura Kirn

Date: 06/20/2012

*Check if project does not involve ground disturbance*

Assessment of Effect:  No Historic Properties Affected     No Adverse Effect     Adverse  
Effect     Streamlined Review

Recommendations for conditions or stipulations:

Doc Method: No Potential to Cause Effects [800.3(a)(1)]

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Anthropologist

Name: Jennifer Hardin

Date: 07/26/2012

Comments: No tribal comments received (June 2012 Tribal Project Review List).

*Check if project does not involve ground disturbance*

Assessment of Effect:  No Historic Properties Affected     No Adverse Effect     Adverse  
Effect     Streamlined Review

Recommendations for conditions or stipulations:

Doc Method: Park Specific Programmatic Agreement

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Historical Landscape Architect

Name: David Humphrey

Date: 06/21/2012

*Check if project does not involve ground disturbance*

Assessment of Effect:  No Historic Properties Affected     No Adverse Effect     Adverse  
Effect     Streamlined Review

Recommendations for conditions or stipulations:

Doc Method: No Potential to Cause Effects [800.3(a)(1)]

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**No Reviews From:** Curator, Historical Architect, Historian, 106 Advisor, Other Advisor

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**C. PARK SECTION 106 COORDINATOR'S REVIEW AND RECOMMENDATIONS**

**1. Assessment of Effect:**

<u>      </u> <b>No Historic Properties Affected</b>	<u>  X  </u> <b>No Adverse Effect</b>	<u>      </u> <b>Adverse Effect</b>
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**2. Documentation Method:**

A. STANDARD 36 CFR PART 800 CONSULTATION

Further consultation under 36 CFR Part 800 is needed.

B. STREAMLINED REVIEW UNDER THE 2008 SERVICEWIDE PROGRAMMATIC AGREEMENT (PA)

The above action meets all conditions for a streamlined review under section III of the 2008 Servicewide PA for Section 106 compliance.

APPLICABLE STREAMLINED REVIEW Criteria  
(Specify 1-16 of the list of streamlined review criteria.)

C. PLAN-RELATED UNDERTAKING

Consultation and review of the proposed undertaking were completed in the context of a plan review process, in accordance with the 2008 Servicewide PA and 36 CFR Part 800.

Specify plan/EA/EIS:

D. UNDERTAKING RELATED TO ANOTHER AGREEMENT

The proposed undertaking is covered for Section 106 purposes under another document such as a statewide agreement established in accord with 36 CFR 800.7 or counterpart regulations.

Specify: 1999 Programmatic Agreement

E. COMBINED NEPA/NHPA Document

Documentation is required for the preparation of an EA/FONSI or an EIS/ROD has been developed and used so as also to meet the requirements of 36 CFR 800.3 through 800.6

F. No Potential to Cause Effects [800.3(a)(1)]

G. Memo to SHPO/THPO

H. Memo to ACHP

**3. Additional Consulting Parties Information:**

**Additional Consulting Parties: No**

**4. Stipulations and Conditions:**

**Following are listed any stipulations or conditions necessary to ensure that the assessment of effect above is consistent with 36 CFR Part 800 criteria of effect or to avoid or reduce potential adverse effects.**

**5. Mitigations/Treatment Measures:**

**Measures to prevent or minimize loss or impairment of historic/prehistoric properties:  
(Remember that setting, location, and use may be relevant.)**

**No Assessment of Effect mitigations identified.**

**D. RECOMMENDED BY PARK SECTION 106 COORDINATOR:**

**Acting Historic Preservation Officer**

//Kimball E. Koch//

**Date:** //7/30/12//

Kimball Koch

**E. SUPERINTENDENT'S APPROVAL**

**The proposed work conforms to the NPS *Management Policies* and *Cultural Resource Management Guideline*, and I have reviewed and approve the recommendations, stipulations, or conditions noted in Section C of this form.**

**Superintendent:** //Tom Medema//Acting

**Date:** //8/9/12//

Don L. Neubacher

*The signed original of this document is on file at the  
Environmental Planning and Compliance Office in  
Yosemite National Park.*