



United States Department of the Interior

NATIONAL PARK SERVICE

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

IN REPLY REFER TO:
L7617 (YOSE-PM)

Memorandum

To: Steve Thompson, Project Manager, Resources Management and Science, Yosemite National Park

From: Superintendent, Yosemite National Park

Subject: Notice to Proceed, 2007-099 Experimental Reintroduction of Sierra Nevada Yellow-Legged Frogs to Restore Ecosystem and Visitor Experience

Your proposed project is an action that has been determined to result in no measurable environmental effects. It is therefore categorically excluded from further National Environmental Policy Act analysis under Categorical Exclusion: DO12 3.4 *E (2) - Restoration of noncontroversial (based on internal scoping requirements in section 2-6) native species into suitable habitats within their historic range.*

Necessary compliance coordination has been completed regarding the National Historic Preservation Act, the Wilderness Act, the Wild and Scenic Rivers Act, and the Endangered Species Act, as applicable. This project clearance is valid providing that you adhere to any conditions that may be stipulated in the enclosed *Categorical Exclusion Form* and associated documents when implementing this project.

// R. Kevin Cann // acting for
Michael J. Tollefson

8/23/07
Date

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

(Version: OCT06)

Compliance Tracking Number: 2007-099

PEPC Project Number: 19619

A. PROJECT INFORMATION

Title: Experimental Reintroduction of Sierra Nevada Yellow-Legged Frogs to Restore Ecosystem and Visitor Experience

Location: Wilderness, Mariposa and Tuolumne Counties, California

Project Manager: Steve Thompson, Resources Management and Science, Yosemite National Park

B. COMPLIANCE DETERMINATION

This project is an action that has been determined to result in no measurable environmental effects. It is therefore categorically excluded from further National Environmental Policy Act (NEPA) analysis under Categorical Exclusion: DO12 3.4 E (2) - *Restoration of noncontroversial (based on internal scoping requirements in section 2-6) native species into suitable habitats within their historic range.*

Necessary compliance coordination has been completed regarding the National Historic Preservation Act, the Wilderness Act, the Wild and Scenic Rivers Act, and the Endangered Species Act, as applicable. Environmental impacts will be negligible or less when the project is implemented with the conditions stipulated under **Project Mitigations and Conditions** in **Section I** at the end of the attached *Environmental Screening Form*.

Additional supporting information for this determination and the stipulated conditions can be found in the following attachments (when checked):

- ☒ *Environmental Screening Form*
- ☐ *Preservation Assessment Form (YOSE-XXX)*
- ☒ *Wilderness Minimum Requirement Analysis*
- ☐ *Wild and Scenic River Section 7 Determination*
- ☐ Other:

C. DECISION

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 or conditions in DO12 3.5 or 3.6 apply and the action is fully described in DO12, Section 3.4.

// R. Kevin Cann // acting for
Michael J. Tollefson, Superintendent

8/23/07
Date

Original: Statutory Compliance File
cc: Project Proponent

Attachments (2)

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

Environmental Screening Form

(Version: NOV06)

Compliance Tracking Number: 2007-099

PEPC Project Number: 19619

A. PROJECT INFORMATION

Title: Experimental Reintroduction of Sierra Nevada Yellow-Legged Frogs to Restore Ecosystem and Visitor Experience

Location: Wilderness, Mariposa and Tuolumne Counties, California

Project Manager: Steve Thompson, Resources Management and Science, Yosemite National Park

B. PROJECT DESCRIPTION AND BACKGROUND

This experimental study would seek to restore the rapidly declining endangered Sierra Nevada yellow-legged frog (SNYF) *Rana sierrae* to high elevation lakes over a 3-4 year period. Habitat restoration of aquatic ecosystems in conjunction with reintroduction of the SNYF will provide critical information to wildlife managers for successfully managing the recovery of the SNYF. Standardized surveys for the SNYF at study locations will be conducted to determine success of restoration and frog recovery efforts. As a keystone species, recovery of the SNYF will indicate successful restoration of the aquatic ecosystem. Data collected will be used to develop restoration techniques for the Aquatic Resources Management Plan, which will be written beginning in 2008. Three of the lakes are adjacent to existing frog populations where natural recolonization is likely, whereas the other 3 lakes would need to have frogs reintroduced from a source population. This provides a pairwise test of habitat restoration and frog reintroduction techniques. Lakes were selected by the criteria that they contain relatively few fish, are little used by fishermen, and are within 10 km of the source frog population (for transportation by foot), or have an existing population nearby for natural recolonization. Predation by introduced non-native fish has contributed to the decline of the SNYF and has resulted in fragmentation of the remaining SNYF population across the landscape. More recently, the lethal effects of the fungal disease chytridiomycosis, caused by the fungus *Batrachochytrium dendrobatidis* (B.d. or chytrid), found throughout the Yosemite landscape, has exacerbated the decline. Present frog populations are 95% below historical levels, and are declining at the rate of approximately 10% per year.

Table B1 – Background Information

	Yes	No	N/A	Explanation/Notes
1. Did NPS staff conduct a site visit? If yes, list attendees. If no, explain.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Resources Management and Science staff.
2a. Is the project providing compliance for an action associated with but not covered by an approved plan? (Identify the plan and provide a section or page citation.); OR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2b. Is the project in an approved plan? (Identify the plan and provide a section or page citation.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2c. Is the project consistent with that plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2d. Is the Plan's CE, FONSI, or ROD current?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3a. Are there any interested or affected parties?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3b. Has a diligent effort been made to communicate with them?	<input type="checkbox"/>			
4a. Are there any affected agencies or tribes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4b. Has consultation been completed?	<input type="checkbox"/>			

Table B2 – Environmental Screening Form Attachments (provide Attachment letter—A, B, etc.)

	Yes	No	N/A	Explanation/Notes
1. Maps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Map of lakes selected for study; see Attachment A.
2. Drawings (e.g., design, construction)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Site Plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Photographs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5. Non-NEPA/NHPA Approvals (Explain)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6. Other (Explain)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lake specifications table; see Attachment B.

**Yosemite National Park
ENVIRONMENTAL SCREENING FORM**

Compliance Tracking No. 2007-099

Are any impacts possible on the following resources?	Yes	No	N/A	Data Needed to Determine/Notes
1. Geologic resources: soils, bedrock, streambeds, etc	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. From geohazards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Air quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Soundscapes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5. Water quality or quantity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6. Stream flow characteristics	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7. Marine or estuarine resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8. Floodplains or wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9. Land use, including occupancy, income, values, ownership, type of use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10. Rare or unusual vegetation – old growth timber, riparian, alpine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11. Species of special concern (plant or animal; state or federal listed or proposed for listing) or their habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12. Unique ecosystems, biosphere reserves, World Heritage Sites	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yosemite National Park is a World Heritage site; no historic properties would be adversely affected by implementing this project; see Section F, National Historic Preservation Act Checklist, below.
13. Unique or important wildlife or wildlife habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14. Unique or important fish or fish habitat	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15. Introduce or promote non-native species (plant or animal)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16. Recreation resources, including supply, demand, visitation, activities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
17. Visitor experience, aesthetic resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Visitor experience will be enhanced by maintaining and restoring Yosemite's aquatic ecosystems including the native Sierra Nevada yellow-legged frogs.
18. Cultural resources including cultural landscapes, ethnographic resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
19. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
20. Minority and low income populations, ethnography, size, migration patterns, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
21. Energy resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
22. Other agency or tribal land use plans or policies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
23. Resource, including energy, conservation potential	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
24. Urban quality, gateway communities, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
25. Long-term management of resources or land/resource productivity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Long-term management of natural resources includes the reintroduction of the native Sierra Nevada yellow-legged frogs.
26. Other important environment resources (e.g. geothermal, paleontological resources)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Comments, Mitigations and Conditions:				
1. None				

D. MANDATORY CRITERIA

If implemented, would the proposed action:	Yes	No	N/A	Data Needed to Determine/Notes
1. Have material adverse effects on public health or safety?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Have adverse effects on such unique 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; floodplains; or ecologically significant or critical areas, including those listed on the National Register of Natural Landmarks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mitigated: see the attached Minimum Requirement Analysis.
3. Have highly controversial environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6. Be directly related to other actions with individually insignificant, but cumulatively significant, environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7. Have adverse effects on properties listed or eligible for listing on the National Register of Historic Places?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Have adverse effects on species listed or proposed to be listed on the List of Endangered or Threatened Species or have adverse effects on designated Critical Habitat for these species?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9. Require compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), or the Fish and Wildlife Coordination Act?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10. Threaten to violate a federal, state, local, or tribal law or requirement imposed for the protection of the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11. Involve unresolved conflicts concerning alternative uses of available resources (NEPA sec. 102(2)(E))?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12. Have a disproportionate, significant adverse effect on low-income or minority populations (EO 12898)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13. Restrict access to and ceremonial use of Indian sacred sites by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 130007)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14. Contribute to the introduction, continued existence, or spread of federally listed noxious weeds (Federal Noxious Weed Control Act)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15. Contribute to the introduction, continued existence, or spread of non-native invasive species or actions that may promote the introduction, growth or expansion of the range of non-native invasive species (EO 13112)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16. Require a permit from a federal, state, or local agency to proceed, unless the agency from which the permit is required agrees that a CE is appropriate?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
17. Have the potential for significant impact as indicated by a federal, state, or local agency or Indian tribe?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
18. Have the potential to be controversial because of disagreement over possible environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
19. Have the potential to violate the NPS Organic Act by impairing park resources or values?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments, Mitigations and Conditions:

1. None

E. SPECIAL STATUS SPECIES CHECKLIST

Within the area of potential effect, are there:	Yes	No	N/A	Data Needed to Determine/Notes
1. Listed or proposed threatened or endangered species (Federal or State)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Species of special concern (Federal or State)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Park rare plants or vegetation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Potential habitat for any special-status species listed above?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If "yes" to any of the above questions, a Special-Status Species Checklist must be completed and attached.				
Comments, Mitigations and Conditions:				
1. None				

F. NATIONAL HISTORIC PRESERVATION ACT CHECKLIST

Within the area of potential effect:	Yes	No	N/A	Data Needed to Determine/Notes
1. Will there be ground disturbance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Are there any archeological sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Are there any Native American Indian traditional cultural resources?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Is there a historic property (a building, structure, feature, or all or any part of an archeological district or site, or a historic district or site, or any associated landscape element) that is listed or eligible for listing on the <i>National Register</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5. Is there a National Historic Landmark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6. Is there a structure(s) on the park's <i>List of Classified Structures</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7. Is there any cultural resource requiring an evaluation of eligibility as a historic property under NHPA, Section 106, before an affect determination can be made?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Would there be alteration of any historic property or associated landscape element covered by 2-7, above?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If "yes" to <u>any</u> of the above, then an Assessment of Effects form (YOSE-XXX) must be completed and attached.				
Mitigations and Conditions:				
1. None				

G. WILDERNESS ACT CHECKLIST

Is the proposed project:	Yes	No	N/A	Data Needed to Determine/Notes
1. Within designated Wilderness?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Condition 1, below and the attached Minimum Requirement Analysis.
2. Within a Potential Wilderness Addition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If "yes" to either of the above, then a Wilderness Minimum Requirements Analysis must be completed and attached.				
Mitigations and Conditions:				
1. <ul style="list-style-type: none"> a) Camp at least 100 feet from water, which will reduce disruption of sunning and foraging behavior of the frogs. b) Camp away from fragile, untrampled lake fringing wetland vegetation, which will reduce impacts to potential foraging areas. c) Avoid washing with any substances 100 feet of the lake and other nearby water bodies to avoid contaminating the water. d) Deposit human and food waste in the ground at least 100 feet from water to ensure high water quality. e) Minimize the number of lakeshore drinking access points to those near the trail to avoid disrupting frogs and impacting habitat. f) Keep stock at least 100 feet away from water, including circumnavigating the lake, except to access existing stock camps, to avoid disrupting the sunning and foraging behavior of the frogs and to minimize soil erosion and vegetation 				

damage, which affect water quality.
g) Monitor pack stock use at the lake to assess additional potential conflicts.
h) Where possible, encourage the number of stock to be less than the maximum allowable.

H. WILD AND SCENIC RIVERS ACT CHECKLIST

Does the proposed project:	Yes	No	N/A	Data Needed to Determine/Notes
1. Fall within a wild and scenic river corridor? If "yes", name the river(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Merced and Tuolumne River.
2. Fall within the bed and banks AND affect the free-flow of the river?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Potentially affect water quality of the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Diminish or other wise change the values for which the river was designated as a Wild and Scenic River? If "yes", explain.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5a. Fall on a tributary of a Wild and Scenic River?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5b. If 5a is "yes", will the project affect the Wild and Scenic River corridor?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5c. If 5a is "yes", will the project unreasonably diminish scenic, recreational, or fish and wildlife values?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If "yes" to questions 2, 5b, or 5c, then a WSRA Section 7 determination must be completed and attached.				
Mitigations and Conditions:				
1. None				

I. NEPA Analysis and Approval Conditions

When implemented as detailed in the project description and following all Project Mitigations and Conditions listed below, this project meets the terms and conditions of a categorical exclusion to NEPA.

Applicable Categorical Exclusion:

DO12 3.4 E (2) - *Restoration of noncontroversial (based on internal scoping requirements in section 2-6) native species into suitable habitats within their historic range.*

Project Mitigations and Conditions:

1. a) Camp at least 100 feet from water, which will reduce disruption of sunning and foraging behavior of the frogs.
- b) Camp away from fragile, untrampled lake fringing wetland vegetation, which will reduce impacts to potential foraging areas.
- c) Avoid washing with any substances 100 feet of the lake and other nearby water bodies to avoid contaminating the water.
- d) Deposit human and food waste in the ground at least 100 feet from the water to ensure high water quality.
- e) Minimize the number of lakeshore drinking access points to those near the trail to avoid disrupting frogs and impacting habitat.
- f) Keep stock at least 100 feet away from water, including circumnavigating the lake, except to access existing stock camps, to avoid disrupting the sunning and foraging behavior of the frogs and to minimize soil erosion and vegetation damage, which affect water quality.
- g) Monitor pack stock use at the lake to assess additional potential conflicts.
- h) Where possible, encourage the number of stock to be less than the maximum allowable.
(Wilderness)

This project has been reviewed in accordance with the above criteria and it has been determined that the project will result in no or minimal environmental effects. Therefore, it is categorically excluded from further environmental review required under the National Environmental Policy Act. Additionally, the necessary compliance coordination has been completed with regard to the National Historic Preservation Act, the Wilderness Act, the Wild and Scenic Rivers Act, and the Endangered Species Act.

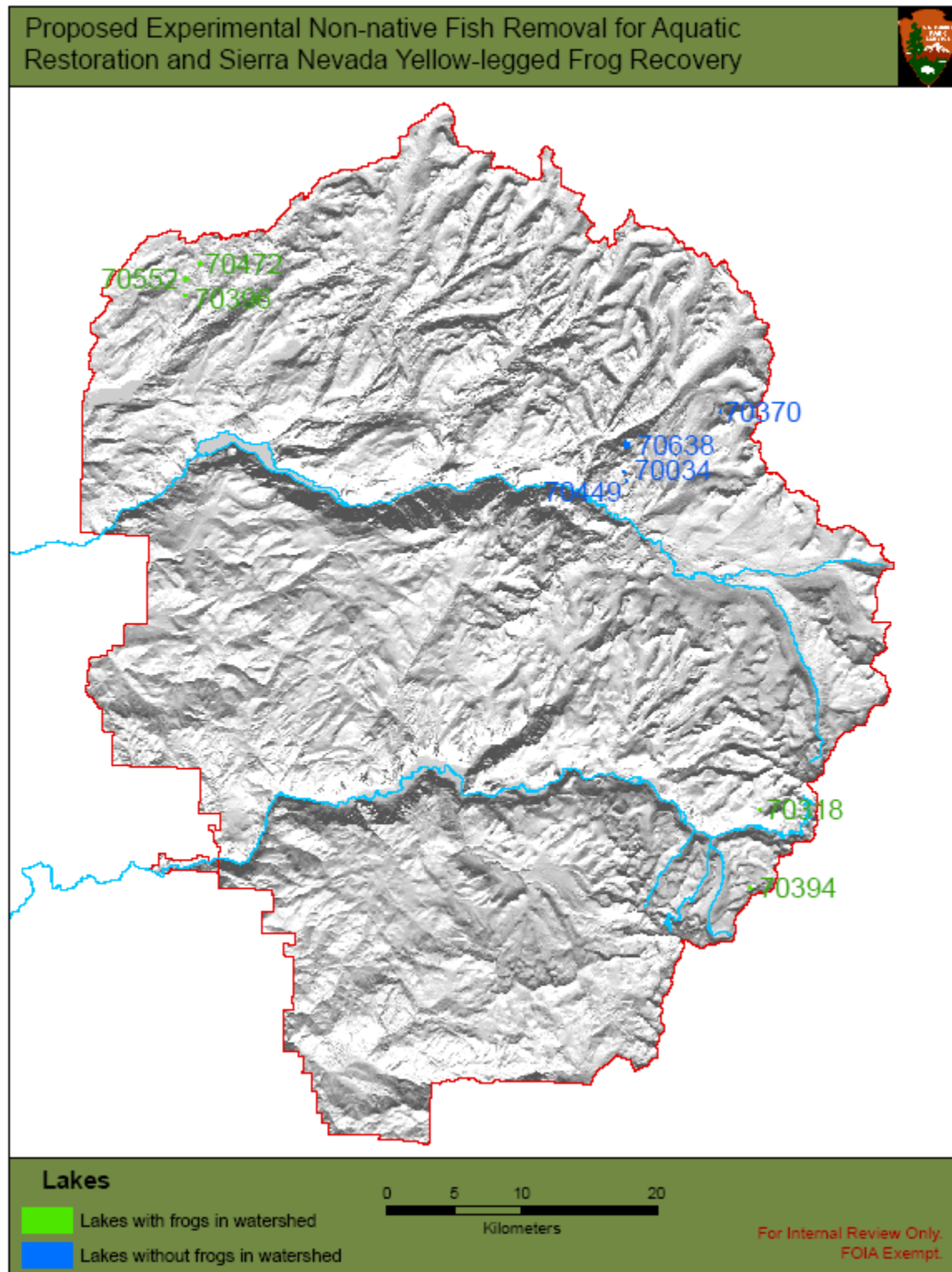
// Renea Kennec // 8/14/07
Compliance Specialist Date

// Mark A. Butler // 8/15/07
Compliance Program Manager Date

// Bill Delaney // 8/16/07
Chief, Project Management Date

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

Attachment A



Experimental non-native fish removal from remote Yosemite lakes to inform Sierra Nevada yellow-legged frog recovery in a chytrid landscape.

Jeff Maurer, Steve Thompson

Wildlife Branch, Resources Management and Science, Yosemite National Park

June 7, 2007

Purpose of Study:

This study is designed to test the feasibility of removing introduced non-native fish from select high-elevation lakes in Yosemite for the restoration of aquatic systems, including the recovery of the rapidly declining Sierra Nevada yellow-legged frog (SNYF) *Rana sierrae*. Data collected will be used to assess landscape variables and restoration techniques suitable for future aquatic restoration proposals that will be developed in the writing of the Aquatic Resources Management Plan, due to begin in 2008. Predation by introduced non-native fish has contributed to the decline of the SNYF and has resulted in fragmentation of the remaining SNYF population across the landscape. More recently, the lethal effects of the fungal disease chytridiomycosis, caused by the fungus *Batrachochytrium dendrobatidis* (B.d. or chytrid), found throughout the Yosemite landscape, has exacerbated the decline, although a very few populations appear to be persisting despite chytrid infection. Currently non-native fish exist in watersheds that also contain SNYFs and in some without SNYFs.

This study is designed to test 1) whether non-native fish removal and subsequent frog recovery is feasible in the chytrid-infested landscape, and 2) whether non-native fish removal and subsequent SNYF recovery is more likely in watersheds with or without current SNYF populations. Two methods will be tested to evaluate their effectiveness in addressing SNYF restoration: 1) Removal of non-native fish from water bodies in watersheds in which SNYFs are present and would likely re-colonize those suitable habitats and 2) removal of non-native fish in water bodies in watersheds that do not currently contain SNYFs, thus necessitating translocations from nearby source populations.

Yosemite's high elevation aquatic systems – lakes, streams, ponds, and marshes – have undergone substantial change in faunal composition of invertebrates and vertebrates, including a 95% decline of the historically common Sierra Nevada endemic SNYF, due in part to predation by introduced non-native trout (rainbow, brook, brown, golden, Lahontan cutthroat, and goldenxrainbow hybrid) over the past 117 years. It is believed that none of Yosemite's mid to high elevation lakes historically contained fish due to recent glaciation and natural fish barriers. The practice of fish planting was carried out primarily by the California Department of Fish and Game, which by the 1950's included aerial stocking. Fish stocking began to be phased out in Yosemite starting in 1972 and was completely terminated by 1991. In 2000-2002, non-native trout were found in 9% (245 of 2655) of all Yosemite lakes, and in 54% (112 of 209) of lakes suitable for both trout and SNYFs, (lakes deeper than 4 meters and larger than 2 hectares) containing non-native fish. An additional 41 lakes that formerly contained non-native trout had reverted to a fishless condition by that time due to lack of sufficient spawning habitat.

Severe decline of the SNYF throughout its range has left the Yosemite population critically low with decreasing opportunities for restoration. Only one SNYF population currently exists in Yosemite that is large enough to be considered as a suitable source for translocations to unoccupied habitat, with very few other potential sites, and there are a decreasing number of watersheds in which SNYFs exist that could potentially recolonize historic habitat. However, the future of these source populations is uncertain due to the generally lethal effects of chytrid fungus and perhaps other causes of decline.

Immediate action to address strategies for the recovery of the Sierra Nevada yellow-legged frog and the associated aquatic systems is crucial. To further restore Yosemite's high elevation aquatic systems, including the recovery of the SNYF, removal of non-native fish from strategically important lakes and ponds will be necessary. Experimental non-native fish removals beginning this summer will inform us of the efficacy of utilizing this tool for future parkwide aquatic and SNYF restoration under a proposed future Aquatic Resources Management Plan. The project is proposed for the next 3-4 years beginning in 2007 and is funded through the Fee Demonstration program.

Summary of Proposed Field Methods:

We propose to initiate removal of all non-native fish from up to four lakes or lake complexes beginning this season, with the addition of two more lakes in 2008. Eradication of non-native fish is expected to take 2-3 years for each lake. Lakes chosen for experimental non-native fish removal were selected using the following selection criteria decision tree: 1) presence of non-native fish; 2) high likelihood of restoring the SNYF; 3) removal of all non-native fish is feasible and fish absence can be maintained; 4) lake is small to medium in size; 5) presence of a fish barrier within 200 m of the lake and no fish occurring in the watershed above the lake; 6) low angler and visitor use and off trail; 7) low to moderate non-native fish population; 7) either the lake is within 10 km of a source population or the watershed currently contains SNYF for natural recolonization.

Three sites were chosen in watersheds that currently have SNYFs and three sites were chosen in watersheds that do not currently have SNYFs but are within 10 km from a source population (see table). Sites that lack SNYFs were selected within 10 km of the source population to minimize the possibility of spreading chytrid fungus over great distances and avoid necessitating a helicopter for eventual transport of frogs. Field work is proposed from mid June through late September, with a reduced number of nets set overwinter.

Non-native fish removal is proposed using in-lake lightweight monofilament gill nets. Gillnets 35 m in length and 2 m in height are deployed throughout the water body and checked and cleaned once daily for captured fish. Gillnets are set perpendicular to shore and suspended vertically on the lake bottom using a submerged float line attached to shore by a small cord. Gillnets are usually set overnight. Gill nets are set and retrieved manually using an inflatable float tube, waders, and fins. All captured fish are removed by hand, identified to species, the length measured, and counted. All carcasses are deposited and sunk in the deepest portion of the lake to retain the nutrients of that fish in the lake system and to ensure that carcasses are not available to scavengers (bears, coyotes, ravens, etc.). Gillnets are not visible, except by a short (<1 m) green line at shore and by a 2" diameter tan-colored float suspended at the distant end of the net. A small 2"x 2" label is attached to the shore end of the net to advise visitors. Fish are removed

from inlet and outlet streams up to 200m from the lake using a battery-powered electro-fisher device and deposited likewise in the nearby lake after processing as above.

Attachment B

Lakes proposed for experimental non-native fish removal in Yosemite NP, 2007-2010

common name or site reference	Knapp Lake ID	area (ha)	perimeter (m)	depth (m)	elevation (m)	fish population estimate (Knapp 2003)	fish species	distance from trail (km)	visitor use	angler use
Bartlett Creek	70472	2.9	1434	11.50	2256	~100 for all three	brown, rainbow	8-10	low	low
	70552	4.7	2118	18.50	2146	~100 for all three		8-10	low	low
	70396	2.1	1163	3.50	2097	~100 for all three		8-10	low	low
Cold Mtn	70449	2.6	681	6.75	2921	~660	brook	3.5	low	low/moderate
	70034	0.5	351	4.00	2911	~200		3.0	low	low
Harriet #2	70394	2.0	535	6.00	3103	~200	rainbow	2.0	low	low
Tiny McCabe	70370	1.8	578	10.00	3188	~200	rainbow	1.5	low	low
Virginia	70638	12.5	1444	10.50	2815	~100	brook	4.0	low	low
Hutchings	70318	1.5	757	4.00	3133	~500	goldenxrainbow	3.0	low	low

*****ADDENDUM*****
Wilderness Act
Minimum Requirement Analysis

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Sierra Nevada Yellow-legged Frog Restoration

Title: A Proposal to Reintroduce *Rana sierrae* to Fishless Lakes in Yosemite National Park (and related studies)

Principal Investigator: Roland Knapp

Institution: Sierra Nevada Aquatic Research Lab (SNARL) UC, Santa Barbara

Research Permit Application Number: 34046

Previously assigned NPS study number: YOSE-00193

Previously assigned NPS permit number: YOSE-2006-SCI-0075

Prepared by: Jeff Maurer, Wildlife Branch, Resource Management and Science,
June 4, 2007

This document is an addendum to the June 14, 2005 MRA written for related research with the same title and principal investigator. The current proposed research includes additional objectives that may affect wilderness character.

Background and Summary

The Sierra Nevada yellow-legged frog (SNYF) *Rana sierrae* (formerly known as the mountain yellow-legged frog (MYLF) *Rana muscosa*) is endemic to the northern and central California Sierra Nevada where it inhabits high elevation lakes, ponds, and streams in all life stages. This species has undergone severe population declines of greater than 90% and its population trend is currently on a trajectory towards extinction. It was once widespread throughout its range but is now found at less than 150 sites in Yosemite, with a majority of populations containing less than 10 adults.

Causes for decline include predation by non-native fish, chytrid fungus, and possibly additional environmental factors, such as pesticides. This species and its sister taxon, the Sierra Madre yellow-legged frog of the southern Sierra Nevada, together comprising the former mountain yellow-legged frog taxon, was found to be warranted as a federal Endangered Species in 2002 by USFWS, but was precluded from listing.

Despite widespread occurrence of chytrid fungus among Yosemite's SNYF populations, a handful of populations are apparently persisting despite infection. Currently, there exist approximately 4-6 populations of greater than 50 adults in Yosemite, all infected with chytrid, and only one population, a pond near Roosevelt Lake, that is large enough to consider as a source for translocations for frog recovery without impacting the source population itself.

In order to restore Yosemite SNYF populations, translocations of adults from extant populations into eight sites of appropriate habitat type (elevation, depth, size) and fishless state, and where SNYFs once existed, were proposed in 2005. Due to the emerging lethal fungal disease chytridiomycosis and its severe population-level effects, this proposal was delayed until 2006 and modified to avoid spreading the disease by limiting translocation sites to within approximately 10 km of potential source populations, which limited target

site options, and also prompted a resurvey of all known SNYF populations in the park. This limitation also precluded the need for a helicopter to translocate the frogs, as all translocations conducted and proposed thus far are by foot.

In 2006, SNYFs were translocated into three sites (McGee, Lower Skelton, and Tioga Pass), to test whether these “persistent” populations can be used to establish other “persistent” populations in Yosemite, and to investigate the role of habitat complexity on frog recovery. 40 frogs were translocated to each site.

In order to further address the recovery of Yosemite’s aquatic ecosystems, including SNYF recovery, the current proposal includes:

- 1) Continuation of population and chytrid monitoring of the 2006 translocations and source population;
- 2) Translocation of SNYFs from the source population near Roosevelt Lake into two lakes, Miller Lake and a small unnamed lake approx. 1 mile NE of Elbow Hill in Cold Canyon and monitor the population and chytrid infection rates at these sites.
- 3) Completion of resurveys at all sites with known SNYF populations from 2000-2002 that have not yet been resurveyed in 2005-2006 (approx. 50 sites);
- 4) Continuation mark-recapture studies to describe SNYF-chytrid dynamics at persistent sites;
- 5) Re-sampling of non-native fish at up to 15 sites to inform future non-native fish eradication program for SNYF and aquatic system recovery;
- 6) Sampling of aquatic invertebrate communities in up to 20 lakes to obtain baseline measures and document subsequent changes to the aquatic ecosystem at lakes at which fish eradication will be considered or proposed.

All techniques and methods in the above objectives have been utilized in Yosemite since 2000 to address SNYF, aquatic habitat, including non-native fish status, chytrid monitoring, and SNYF recovery.

Step 1

Will the proposed action take place in designated Wilderness?

Yes.

Step 2

Is the proposed action required for the administration of the Yosemite Wilderness?

Yes. The proposed research and management will enhance the biodiversity and ecosystem integrity of the Yosemite wilderness through the restoration of native aquatic systems including the recovery and conservation of the rapidly declining SNYF.

These management and monitoring actions will increase the likelihood of maintaining and restoring Yosemite’s aquatic ecosystems including SNYF populations, a species warranted for Endangered Species status under the federal Endangered Species Act.

Proposed completion of amphibian re-surveys will inform managers of the current distribution and abundance of at risk species. Proposed research aimed at understanding the aquatic ecosystem, including the factors that allow for the persistence of some SNYF populations, including the roles of elevation, habitat complexity, invertebrate community, chytrid abundance and distribution, and current non-native fish distribution and

persistence, will inform the decisions of wildlife managers regarding the restoration and maintenance of these at-risk species and communities.

Ecosystem management and biological diversity conservation based on the best science available will allow for a continued quality wilderness experience.

Step 3

Can the objectives of the proposed action be met with actions outside of wilderness or potential wilderness?

No. The objectives of the proposed action cannot be met by actions outside of the Yosemite Wilderness. The vast majority of SNYF populations, including potential recovery populations, are within designated Wilderness. Nearly all of the current and former range of MYLF in Yosemite is in wilderness and nearly all of the current range of MYLF outside of Yosemite is in wilderness.

The project lakes all occur in wilderness and were selected for:

- a.) Appropriate habitat for reestablishing or maintaining viable populations of frogs. Specifically alpine or sub-alpine lakes below 10500' in elevation and deeper than 4 meters;
- b.) The absence of non-native fish;
- c.) The availability of an existing population of frogs within approximately 10 km distance that would allow foot transportation of frogs to the new site and avoid the unnecessary spread of chytrid fungus.

Step 4

Alternatives to meet the objective of the proposed action.

Alternative 1. No Action.

Alternative 2. Proposed Action.

The Proposed Actions consists of six goals:

Goal 1. Monitor the reintroduced SNYF population at the three 2006 reintroduction sites McGee Lake (Knapp Lake ID 70414), Lower Skelton Lake (70550), and Tioga Pass Pond (70134) and one source population, Conness Pond (72996).

Objectives: Visit each site 4-5 times between May 30 and Oct 15 to quantify:

- 1) population size,
- 2) survivorship,
- 3) morphological metrics, and
- 4) chytrid infection levels.

Methods:

- 1) Frog population size is measured using non-invasive Visual Encounter Surveys in which data is collected by walking the edge of the lake and counting the number of individuals observed.
- 2) Frog survivorship is measured by capturing all frogs using a dip net at the reintroduction sites and up to 40 frogs at the source site and reading the PIT (Passive Integrated Transponder) with a passive PIT tag reader. PIT tags were embedded under the skin of the frog in the previous season(s).

- 3) Each frog captured would be weighed and the snout-vent length measured using a spring scale and calipers.
- 4) Chytrid fungus infection level is obtained by swabbing each individual captured with a nylon swab to collect chytrid fungus residue. Current swabbing protocol requires 30 passes of the swab on the ventral surface and rear appendages. Swabs are air dried and delivered to UC Berkeley for assayed using PCR (Polymerase Chain Reaction).

This is a continuation of research permitted to Knapp in 2005 and 2006 and the effects on wilderness character of this proposed action are addressed in the June 14, 2005 MRA.

The selection of sites within an approximate 10-km radius decreases the risk of transmitting chytrid fungus, or at least transmitting a localized strain of chytrid fungus, over an extensive area, and also avoids the need to propose wilderness helicopter use to translocate the frogs to test the efficacy of establishing additional chytrid-persistent populations.

The use of generally passive visual survey techniques, with the exception of capturing for measuring, weighing swabbing and PIT-tag reading, represents minimal disruption to the translocated frogs. Handling of frogs takes less than 5 minutes per individual.

Tioga Pond is a very visible site that is partly within wilderness. Closure signs posted at the Gaylor Lakes Overflow Parking Lot informing of amphibian restoration encourage the public to use other areas for recreation, but these signs are not in wilderness. Occasional encounters with wilderness users occur at both Tioga Pond and to a lesser extent at McGee Lake are minimized by the 1-2 hour duration of site visits at these small sites. Occasional visitor contact at both Tioga and McGee aids in raising awareness of wilderness aquatic systems among wilderness users. Both Conness Pond and Skelton Lakes are off trail and although they are deeper in wilderness, visitors are rarely encountered at these sites during surveys.

Goal 2

Translocate 40 SNYFs from the Conness Pond source population to each of two sites within approximately 10 km of the source population, Miller Lake (Knapp Lake ID 70505) and a small lake north of Elbow Hill between Cold and Virginia Canyons (70188) (see map) (80 frogs total).

Methods:

Frogs to be translocated will be captured at the Conness Pond source population using a dip net. All captured frogs will be weighed, measured, and swabbed as above, and PIT tagged with 1.2 mm PIT tags, if they currently lack PIT tags. PIT tags are inserted under the skin on the dorsal surface by making a 2.0 mm incision and slipping in the PIT tag. Incision wounds readily heal. Only frogs of greater than 40 mm SVL (snout-vent length) will be captured to avoid stress to smaller individuals. Frogs will be placed ½-liter plastic lab containers (3-4" height) with air holes and 0.5 cm water, one frog per container, and transported in backpacks via foot. Containers are loaded in the top of the packs with the flap open to facilitate ventilation. Estimated hiking time is 1.5 hrs to "Elbow Hill Lake" and 3-4 hours for Miller Lake. At the release site, frogs will be gently encouraged out of the containers onto the shoreline close to deep water to orient and adjust to their new habitat. Frogs will be monitored for at least one hour before departure. Capture, processing and translocation occur in one day per site. Newly established populations will be monitored throughout the summer as per Goal 1 above. Translocations are proposed for early to mid summer (June – early August), to allow frogs to adapt to their new environment and to allow for meaningful assessment of their status prior to winter.

These actions are consistent with those of the Research permitted to Knapp in 2005 and have been addressed under the June 14, 2005 MRA, with the exception of two additional translocation sites.

The proposed translocation of frogs into currently fishless lakes avoids the potentially controversial issue of proposing fish removals prior to frog translocations. The selection of sites within an approximate 10-km radius of the known source population to minimize the spread of chytrid fungus avoids proposing the use of a helicopter to translocate frogs. Confining translocation sites to within approximately 10-km of the source population restricts the choice of appropriate SNYF habitat due to presence of non-native fish in many otherwise suitable habitats as well as the utilization of some restoration sites that also represent popular wilderness destinations.

The first site ("Elbow Hill") occurs 1/2 mile from the PCT and is relatively unused by wilderness travelers.

The second site (Miller Lake) is located on the PCT and is a very popular destination for travelers, particularly stock users. Both sites are currently fishless. Botti (1983) detected three rainbow trout in 1977 which were 10-14", but no small fish, indicating a lack of reproduction and that the habitat was reverting to a fishless state, and in his words, were "in the process of dying out; flow too low for reproduction." Rainbow trout were first planted there in 1911, again in 1944, and on a four-year cycle from 1956 up until 1972. In 2000, Knapp (2003) detected no fish in Miller Lake, confirming return to a naturally fishless state. However, nearby Hook Lake (70494), also an active stock packer site, did contain fish in 2000 (Knapp 2003) as is expected to currently contain fish, although why fish are persisting there is unknown.

The presence of a stock packer camp at Miller Lake is not expected to not pose any serious impediment to the proposed reintroduction, provided basic wilderness regulations are adhered to. Based on physical evidence of pack animal use and communication with the Yosemite Wilderness Manager,

- 1) the current packer camp is several hundred feet away from the lake shore;
- 2) the animals free-pasture usually to a site northwest of the lake (drift fences occur on the PCT below and above the lake) and usually only at night, when the frogs go into the deeper portion of the lake and away from shore (during the day stock are usually tethered at camp).
- 3) stock frequent the lake occasionally to drink, and usually in specific habitual locations that provide easy and clear access to shallow water, areas that frogs often avoid, as they seek sunning spots on the lake shore with quick access to deep water to escape predation;
- 4) frogs would likely dive into deep water for safety when sensing the approach of stock, as they typically do when they are approached by people.

In order to mitigate conflict with user groups at Miller Lake, continued enforcement of Yosemite wilderness regulations is recommended, specifically:

- (1) camping at least 100 feet from water, which will reduce disruption of sunning and foraging behavior;
- (2) camping away from fragile, untrampled lake fringing wetland vegetation, which will reduce impacts to potential foraging areas;
- (3) avoid washing with any substances within 100 feet of the lake and other nearby water bodies to avoid contaminating the water;

- (4) depositing human and food waste in the ground at least 100 feet from water to ensure high water quality;
- Management of stock is recommended to mitigate impact, specifically,
- (1) minimizing the number of lakeshore drinking access points to those near the trail to avoid disrupting frogs and impacting habitat;
 - (2) keeping stock otherwise at least 100 feet away from water, including circumnavigating the lake, except to access existing stock camps, to avoid disrupting the sunning and foraging behavior of the frogs and to minimize soil erosion and vegetation damage, which affect water quality;
 - (3) monitor pack stock use at the lake to assess and address additional potential conflicts
 - (4) where possible, encourage that the number of stock to be less than the maximum allowable.

Encourage all visitors not to handle the frogs, as this will stress the frogs and may cause the spread of chytrid fungus.

Enforcement of these regulations and recommendations should alleviate the need to propose additional alternatives, such as limiting the number or frequency of stock use at the restoration site.

Education of all users at Miller Lake regarding the importance of abiding by wilderness regulations for the sake of the recovery of this population, and of stock users in the recommendations for further mitigating impacts of stock use, will help to raise the awareness of the importance of protecting this site as well as informing the public of Yosemite's SNYF wildlife resource management program. Education could be accomplished by informing all users prior to visiting the site during the wilderness permit process via a flyer informing visitors of the current SNYF issue and the importance of adhering to wilderness regulations and encouraging visitors not to handle the frogs and other amphibians.

Goal 3

Complete SNYF resurveys at the 50 remaining sites of the 282 sites where SNYFs were found in Yosemite during the 2000-2002 amphibian surveys. All other known sites from those original surveys were resurveyed in 2005-2006. Methods include visual encounter surveys, capturing, weighing, measuring and swabbing up to 40 individuals, as outlined above.

These actions are a continuation of those permitted to Knapp in 2006.

Goal 4

Monitor SNYF populations that are persisting despite chytrid infection at three sites, Conness Pond, Unicorn Pond, and Mono Pass, and at up to four additional sites in the Bartlett Creek area north of Eleanor and Kendrick Creeks in the northwest part of the park, depending on the results of 2007 re-surveys, to describe SNYF-chytrid dynamics at a range of elevations. Frogs would be surveyed and monitored as above including captured, weighed, measured, swabbed for Chytrid fungus, and PIT tagged as above.

This goal is as continuation and expansion of the research initiated under co-PI Dr. Cheryl Briggs in 2005 and continued under research permitted to Knapp in 2006.

Goal 5

Re-sampling non-native fish at up to 20 lakes that have SNYF recovery potential to inform management regarding current non-native fish status, identify appropriate habitat for future SNYF translocations, and inform management of sites for potential experimental non-native fish removal for SNYF and aquatic system recovery. Lakes that have reverted to a fishless state may be suitable for SNYF re-introductions. Fish will be sampled using one gillnet per lake for an 8-12 hour period.

Lakes for fish re-sampling include: Dog, Mildred, Bartlett Creek lakelets, Little Bear, Saddle Horse, Grizzly, Mattie, Upper Mattie (Cold Mtn.), Mattie satellite, Budd, Ten, Harriet Lake #2, Upper Granite, Minnow, Tiny McCabe, Middle McCabe, Virginia Lake, Hutchings, Hook, Ardeth, and Peeler.

The technique involves setting one 35-meter-long x 2-meter-tall, gill net at the shore and perpendicular to the shore on the bottom of the lake for an 8-12 hour overnight period, retrieving the net using an inflatable float tube, waders, and fins, and identifying, counting, and measuring all captured fish. All carcasses are deposited in the deepest portion of the lake and sunk to retain the nutrients of that fish in the system and to ensure that carcasses are not available to scavengers (bears, coyotes, ravens, etc.). This fish sampling technique was used in the 2000-2002 lakes surveys.

Mitigation for the presence of the gillnet includes using green line for attaching the net to shore and a tan-colored 2"x 3" float. The only above-water visible portion of the gillnet includes a 1/2-m line to shore, one float at the far end of the net, and a small (2 1/2" x 2 1/2") laminated tag attached to the line informing visitors of the presence of the net, which reads:

**Experimental Gillnet
Please Do Not Disturb
Yosemite National Park
Wildlife Office
(209) 379-1995**

Goal 6

Re-sampling of aquatic invertebrates and zooplankton from up to 20 lakes considered for possible non-native fish removal for aquatic system restoration, including SNYF recovery (those under goal 5), or that are currently fishless and are proposed for SNYF reintroductions this summer (Miller and "Elbow Hill"), to obtain baseline data to allow subsequent assessment of change to the aquatic ecosystem at lakes at which non-native fish eradication is being considered. Samples will be collected using "D" and "tow nets. Organisms will be collected to be identified in the lab and discarded after analysis.

All techniques and methods in the above Goals and Objectives have been utilized in Yosemite since 2000 to address SNYF, aquatic habitat, including non-native fish status, chytrid monitoring, and SNYF recovery.

Alternative 3: Alternate Action

The Proposed Action without SNYF translocations to Miller Lake.

Step 5

Effects of each alternative on wilderness health and character.

Alternative 1. No Action.

This alternative will effect no changes to the health and character of the Yosemite Wilderness. This alternative may impede the recovery of the Sierra Nevada Yellow-legged frog in Yosemite.

Alternative 2. Proposed Action.Biophysical Effects

This Alternative will increase the likelihood of recovering the declining endemic SNYF population and is intended to restore the natural alpine and sub-alpine aquatic ecosystem of Yosemite, most of which occurs in wilderness. The biophysical benefits to Yosemite wilderness of SNYF restoration translocations and monitoring are further discussed in the June 14, 2005 MRA. The biophysical effects of resurveys include short-term (minutes) negligible disruption to SNYFs behavior. The effects of implanted PIT tags is medium-term (several years until natural mortality) and apparently negligible to the health of the individuals. The effects of fish and invertebrate sampling will have short term negligible effects on the Yosemite wilderness biophysical health and character. Although the fish to be sampled are non-native, fish sampling removes typically less than 1% of fish present.

Under this alternative, shoes, nets, and all other equipment that come in contact with water and frogs will be disinfected with a 0.008% solution of quaternary ammonia or exposed until dry between visits to different lakes to eliminate the chance of spreading chytrid fungus to any healthy frog populations. The quaternary ammonia solution will be deposited into organic soil and lightly covered with organic material to speed its decomposition. Quaternary ammonia is less oxidative and volatile, and thus less harsh on skin, gear, and the atmosphere, than chlorine bleach solution.

Experiential effects

The effects of this Alternative will have for the most part very little effect on the experience of wilderness visitors. Most visitors will not notice the introduced frogs at the proposed and existing translocation sites, and for those that do, this will likely enhance their discovery experience. The presence of researchers collecting data on fish, invertebrates, and frogs using the described techniques and equipment will have a short-term (hours) effect on visitor visual and solitude experience. The effects on the natural appearance include negligible short-term effects of the gill net.

Visitor experience may be affected particularly at Miller Lake under this alternative due to its high level of visitor use, including stock use and possible adjustment to stock use and enforcement of wilderness regulations to minimize disturbance to the frogs. Some visitors may be negatively affected by researcher presence or efforts at education, although some visitors may experience education as an enhanced experience.

Wilderness Character Effects

This alternative constrains and manipulates 80 wild SNYFs and the ecosystems into which they are introduced for the purposes of informing and enhancing biodiversity. Enforcement of Wilderness regulations and encouragement of recommendations to decrease disturbance to the frogs, particularly in adjusting stock use, may affect Wilderness character.

Cumulative Effects

Another current SNYF research permit application (Briggs) proposes removing an additional 150 adult SNYFs from Conness Pond to five sites in SEKI for testing of hypotheses regarding chytrid persistence. Together with the proposed reintroductions covered under this MRA addendum, 230 frogs are proposed to be moved from the source population. Combined, these proposals pose a cumulative short-term negative effect on the Conness Pond population. In order to maintain a viable population at this source, moving no more than 20% of the population is proposed. The most recent surveys (Oct 2006) indicate that 1200-1500 adult SNYF exist at Conness Pond, allowing for the removal of no more than 240-300 individuals at the 20% reduction level. If both proposals are permitted and initial surveys this season indicate a population smaller than 1200 adults at Conness Pond, then removal of individuals would be reduced accordingly to remain above the 20% reduction level, down to 30 individuals. If the population at Conness Pond is estimated below 1050, allowing for the removal of no more than 30 frogs to each of the seven sites, both proposals would be reassessed. The number of individuals proposed for removal from the source population may incur an appreciable short-term impact to the source population, but if the current carrying capacity of SNYFs at this site persists, the population is expected to recover over several years. This source population may currently be at or above carrying capacity, due to the small size of adults at that population.

The proposed sampling of aquatic organisms at multiple lakes would increase biophysical effects, but these would still remain negligible, since at each site the biological community is expected to fully recover. Because this alternative proposes aquatic sampling at several lakes in the same region, visitors may encounter the above experiential effects and effect to wilderness character more than once.

Alternative 3: Alternate Action

The Proposed Action without SNYF translocations to Miller Lake.

This alternative would decrease the potential to restore Yosemite's declining SNYF populations by 20% (one of five lakes in 2006 and 2007) and would alleviate the need to communicate to stock user groups, including communicating recommendations to operate compatibly with Yosemite's rare vertebrate wildlife at Miller Lake. This proposal would also reduce by a small amount the population loss of the SNYF source population.

Step 6

Management concerns of the Alternatives.

Alternative 2: Proposed Action

Honoring the Park's agreement with stock users is a concern at Miller Lake, one of the two proposed translocation sites, due to the potential to alter stock use by following the recommend minor changes in stock pasturing and stock access near the lake as described above. However, involvement of the pack stock community is valuable in educating stockers regarding park resources management in reaching out to their clients, and may help to bring awareness to these user groups, and possible gain their support, if knowledge of the presence of rare frogs can be considered as a value to this wilderness user group's wilderness experience.

Additionally, if education becomes a priority at popular sites such as Miller, the risk of purposeful illegal reintroduction of non-native fish would be a concern.

Alternative 3: Alternate Action

This alternative would decrease the potential to restore Yosemite's declining SNYF populations by 20% (one of five lakes in 2006 and 2007) and would alleviate the need to communicate to stock user groups, including communicating recommendations to operate compatibly with Yosemite's rare vertebrate wildlife at Miller Lake. This proposal would also reduce by a small amount the population loss of the SNYF source population.

Step 7

Choice of Alternative

The Proposed Action is selected in order to provide the most likely and robust opportunity to restore Yosemite's declining SNYF population. The negligible effects on visitor experience and the potential risks in slightly modifying stock user practices at Miller Lake are offset by the potential gains in restoring Yosemite's SNYF population and in educating the public, including stock user groups, of the importance in enhancing biodiversity in the park. If successful, this action could have important long-term biological effects of restoring Yosemite's SNYF population and promote understanding between stock users and resource managers by provides an opportunity for awareness and dialog.

While multiple translocations of MYLFs are a significant manipulation of natural processes, the likelihood of continued population decline and the risk of local, if not complete, extinction, justify such action.

For these reasons the Preferred Action is considered the minimum requirement for stabilization and restoration of natural MYLF populations in the Yosemite Wilderness.

Sierra Nevada Yellow-legged Frog Restoration MRA Addendum

Check one:

- ☒ The proposed action is a temporary, one time activity.
☐ The proposed action will be an on-going, long term activity.

Submitted By:

Jeff R. Mann 6/4/07
Date

Set 6/5/07

Reviewed By:

Andrew G. G. G. 6-4-07
Division Chief, RMS Date
(Attach any comments and conditions)

J. Boeyers 6/12/07
Wilderness Manager Date
(Attach any comments and conditions)

Stef/Sue 6/14/07
Chief Ranger Date
(Attach any comments and conditions)

Approved By:

R. K. K. 7/3/07
Superintendent Date
(Attach any comments and conditions)

We would authorize the use of helicopters if that method of transportation improved the survivability of the frogs. JMB