



# United States Department of the Interior

NATIONAL PARK SERVICE

Yosemite National Park

P. O. Box 577

Yosemite, California 95389

IN REPLY REFER TO:  
L7615(YOSE-PM)

## Memorandum

To: Tony Brochini, Project Manager, Yosemite National Park

From: Acting Superintendent, Yosemite National Park

Subject: NEPA and NHPA Clearance: 2007-007 Programmatic Parkwide Trail Routine Maintenance and Repair 2009-2013 (22757)

The Management 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:

- Coordinate activities with the park Archeology and the park Native American Liaison to ensure protection of cultural resources.
- Adhere to the Mitigation Measure Matrix in Attachment A.
- Ensure that all equipment and materials brought into the park are free of non-native, invasive plants and animals, and noxious weeds. All staff working on site shall be informed of and follow best management practices for preventing the introduction and spread of non-native, invasive species as described in Division 1 Specifications, Section 1335.

//Dennis Schramm//

David V. Uberuaga

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.*



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## Categorical Exclusion Form

Project: **2007-007 Programmatic Parkwide Trail Routine Maintenance and Repair 2009-2013**

PEPC ID: **22757**

### Project Description:

This Categorical Exclusion document (CE) will serve as a formal record for routine trail operation and maintenance activities for the years 2009-2013. The Council on Environmental Quality (CEQ) directs agencies to use CEs for actions "which do not individually or cumulatively have a significant effect on the human environment and which are therefore exempt from requirements to prepare an environmental impact statement" (40 CFR 1500-1508). This project is categorically exempt under NPS Director's Order #12, Action 3.4 C (3): Routine maintenance and repairs to non-historic structures, facilities, utilities, grounds, and trails. Trail operation and maintenance activities are necessary to ensure visitor safety and enjoyment, and to promote resource protection by encouraging trail use. Activities covered include: maintaining, repairing, and rebuilding damaged/deteriorated walls, trail tread, drainage structures, creek fords, signs, and other structural elements; rebuilding and repairing trail bridges including decking, railings, approaches, abutments, and stringers (repairs/replacement of bridge abutments and stringers will be performed on a case by case basis after review by appropriate subject-matter experts in the Resources Management and Science Division [RMS]); removing fallen trees and rocks from the trail corridor; repairing sections where erosion has compromised trail integrity; creating barriers to discourage trail shortcutting, trail widening, and use of social trails, in order to allow vegetation outside the trail corridor to recover; and maintaining/repairing asphalt paths and multi-use trails. It is also the intention of this CE to cover trail crew camps once archeological clearance is completed, including any archeological treatment necessary, according to the procedure outlined in the document "Yosemite Trails Program: Preservation Planning Guidelines" attached, and stipulated as a condition of Section 106 compliance. This CE is not intended to cover extensive trail reroutes, major off-trail drainage redirection, bridge abutment relocation, or activities occurring at a great distance from the trail corridor. All work performed within the Tuolumne and Merced Wild and Scenic River boundaries will meet the requirement addressed in the Section 7 Determination.

### Consultation Procedures

This programmatic CE is subject to annual review. Project proponents and responsible parties will submit an annual workplan for all routine work to be performed under this programmatic CE to the Environmental Planning and Compliance Office (EPCO). Consultation with the appropriate subject-matter experts in the Resources Management and Science Division, and the Wilderness Management Program should also occur at that time. For routine maintenance activities not in the annual workplan (e.g., repairing recently damaged trail signs or washed out sections of trail), appropriate subject-matter experts will be contacted, as necessary.

Work performed under this CE must apply the techniques, protocols, and methodologies described below. Work must also occur without significant changes in technology, location, capacity, or appearance. Any

new techniques, etc., or significant changes in the scope of work would trigger consultation with EPCO for review, including any requests for an amendment to the CE to cover the proposed changes. The standard for determining a significant change is based on the potential for increasing environmental impacts, as determined by the Environmental Screening Form (ESF), attached.

### **Required Mitigation Measures**

The trails program must implement, in consultation with the park's subject matter experts, the following overarching conditions in order to minimize potential impacts to natural and cultural resources.

- All routine maintenance activities are contingent upon avoidance of special status species. The trails program is responsible for coordination of activities with appropriate subject-matter experts in the Resources Management and Science Division, through the division liaison, to ensure the protection of natural resources.
- All trail maintenance activities are contingent upon a determination of no adverse effect to cultural resources, including cultural landscapes and historic or prehistoric archeological sites, and American Indian Traditional Cultural Properties that are listed or eligible for listing on the National Register of Historic Places. The trails program is responsible for coordination of activities with appropriate subject-matter experts in the Resources Management and Science Division, through the division liaison, to ensure the protection of cultural resources.

For detailed mitigation measures, see the attached Mitigation Measures table. Mitigation measures applicable to specific activities are also noted below, under Routine Trail Maintenance and Repair Activities.

### **Routine Trail Maintenance and Repair Activities**

Asphalt Trails, Paths, and Multi-Use Trail Maintenance and Repair/Rehabilitation: This work includes standard asphalt maintenance procedures on existing paved surfaces and includes the following:

- Crack Sealing: Cracks are sealed with flexible rubberized asphalt that bonds to the crack walls and moves with the pavement to prevent water intrusion.
- Asphalt Patching: Damaged materials are removed, new aggregate road base is installed and compacted, tack oil is applied, and new asphalt material is installed and compacted.
- Asphalt Overlays: Deteriorated sections of asphalt surface are repaired and overlaid with 1 to 3 inch lifts of new compacted asphalt material.
- Shoulder Maintenance and Repair: As shoulders deteriorate, they are repaired by replacing compacted aggregate road base up to the grade of the asphalt surface to provide edge protection and minimize grade change.
- Asphalt Replacement-in-kind: In locations where existing asphalt is extensively deteriorated, the old asphalt may be removed and recycled into the base course prior to installation of new asphalt.

On steeper sections of the Valley Loop Trail, attention to the adequate drainage of the historic trails will be necessary to avoid excessive concentrations of flow that cause erosion. See Repairing Damaged Trail Structures/Constructing New Trail Structures below.

The park vegetation specialists will be consulted and approve any movement of materials from within or outside the park in order to prevent spreading of invasive species.

Bridge/Boardwalk Repairs and Rehabilitation: Work ranges from minor repairs to individual pieces of decking and railing, to complete replacement of stringers, decking and railings. This work also includes repairs to log and masonry bridge approaches, abutments, piers, and footings. Per historic preservation stipulations, work involving approach, abutment, pier, or stringer repair/replacement will be reviewed by the park Historical Architect and Facilities Management Historic Preservation leader before repairs begin and will be performed in consultation with the aforementioned RMS and historic preservation staff. New construction is not covered by this categorical exclusion.

Blasting: For activities involving blasting, see Rock Quarrying and Rock Removal, below.

All blasting activities will follow guidelines in *NPS Director's Order 65: Explosives Use and Blasting Safety* and the *National Park Service Handbook for the Storage, Transportation, and Use of Explosives*. In order to provide for public safety, trails will be closed by trail crews for the duration of blasting operations. The crew will alert dispatch at the beginning and the end of all blasting operations. A note of the trail closure will be posted at all pertinent trailheads and the Public Information Office will be notified. For large blasts that will be heard in Yosemite Valley, the Yosemite Medical Clinic will also be notified. The Blaster in Charge will assign workers to establish a secure perimeter around the blast site in order to prevent people from wandering into the blast area. The Blaster in Charge will maintain contact with his security detail by voice and radio.

The park Wildlife Specialist will be consulted prior to explosive use, and explosive use will be delayed or avoided if there is any chance that the percussion will have a negative impact on sensitive wildlife in the area (e.g., peregrine falcons).

Brushing: Cutting back brush and small trees that encroach on or block the trail. This task is accomplished using a variety of hand and power tools.

The width of the vegetation removal varies considerably, depending on elevation, aspect, vegetation type, and other factors. On brushy south facing slopes where annual growth can be in excess of three feet per year, the trail is cleared wider. In higher alpine areas where growth is slow, a narrower corridor is brushed. Typically, the standard applied is approximately 3 feet from the edge of the trail. The cuts are made to the ground or to nearest fork in a branch. All cuts are made cleanly, avoiding any shredding or tearing. Tree branches are cut flush with the trunk. Trees with the potential to encroach upon the trail corridor are removed. Young trees are also removed to preserve the integrity of the trail corridor. Stumps are flush cut. Slash is stashed out of sight whenever possible for aesthetic reasons. It may also be used to block trail shortcuts.

Closures: Trails have various levels of closure during repairs. If visitors can safely pass through the work zone while the work is going on, then the workers notify each other when visitors are coming and stop any activities that would have a potential to hurt the visitors (hammer swinging or rock moving) until the visitors pass. Some situations are too dangerous to allow visitors to pass while work is going on (e.g., highline operation or moving stones on a switchback), in which case a trail worker will hold the visitors until work can be stopped and the visitors let through in a group. Popular trails such as the Mist Trail or the Half Dome Trail may need to be completely closed during working hours to allow for visitor safety. If a trail is to be closed, the trailhead is signed and, where possible, an alternate route is established. The Wilderness Management Program, Public Information Office, Daily Report, Park Partners and primary

concessioner and the Yosemite Gateway Partners Incorporated are notified. All seasonal and natural hazard (e.g., rockfall) closure decisions are made by the Visitor and Resource Protection Division.

Condition Assessment: Trails are assessed on a five year rotation for deferred maintenance. An inventory is also maintained of the existing trail structures. Global Positioning System (GPS) locations and photos are taken of trail conditions and structures before and after work is undertaken.

Drainage Structure Maintenance and Cleaning: Shovels, picks, rock bars, rakes and rock hammers are used to maintain, restore or establish trail drainage structures to proper depth and shape for optimum performance. Maintaining drainage structures and digging new ones is performed on the trail tread and the immediately adjacent uphill and downhill slopes.

In some cases, off-trail drainages have been established to help keep the flow of water within the drainage structures. Maintenance of these structures is limited to digging out accumulated dirt, rock and organic material, within the confines of the previously impacted area.

Limbing: A limbing saw is used to cut low hanging branches that intrude into the trail corridor. The standard is generally to cut anything that hangs down to within about ten to twelve feet of the ground. Cuts are made cleanly and flush with the trunk. Slash is stashed out of sight of the trail whenever possible for aesthetic reasons. It may also be used to block trail shortcuts.

Operational Support: The trails program has various activities that would be classified as operational support including:

- Cleaning, maintaining tools – including repair to motorized tools such as chainsaws, rock drills, and pumps.
- Transportation of equipment, food, supplies, stock and personnel.
- Cutting of metal backcountry trail signs.
- Stock support. Stock are used to resupply backcountry trail crews on a weekly basis. One stock team (one packer and horse with five mules) is used per resupply. Stock is fed by grazing or by weed-free feed that is hauled in. Resupply trips are typically completed in one day without an overnight stay. For locations that are too remote to complete a round trip in one day (e.g., Pate Valley, Matterhorn Canyon), overnight stays are required. Stock are kept overnight in traditionally used camps where the stock can be secured in a gated/fenced area. Stock holding areas are located away from waterways and waste is dispersed after use. When no overnight stay is required, waste does not concentrate in one location and is not dispersed or removed. Stock camps are subject to the same prior approval during annual reviews and the same restoration after seasonal use that trail crew camps are.
- Helicopter support. Helicopter support is only used to resupply crews when a trail camp location is so remote that stock support is infeasible or would cause a greater impact to wilderness than helicopter support would. Helicopter support must be approved by Wilderness Management staff on a per project basis, and requires the submission of a separate supplemental Minimum Tool Requirement Analysis.

Repairing Damaged Trail Structures: Repairs are made to damaged, non-functioning trail structures. Drainage, retaining or tread structures are constructed within the trail prism to preserve the tread, maintain drainage, and provide for visitor safety (see the attached definitions for a comprehensive list of trail structures). Trail structures are repaired/constructed using historic materials and methods recommended by the park Historical Architect.

For stone structures, dry stone masonry techniques are typically used. Less commonly, wet masonry is used in some instances. Historic building techniques are replicated whenever possible. Where historic techniques have failed structurally, a stronger construction may be used, with appropriate materials and finishing techniques that are consistent with historic appearance. All rebuilding requires consultation with the park Historical Architect and the historic preservation leader and include before and after photo-documentation.

Minor trail reroutes require case-by-case review and approval by appropriate subject-matter experts in the Resources Management and Science Division and Wilderness Management Program, which will normally take place during the annual review process. Major trail reroutes are not covered under this CE.

Shovels, rock bars, single jacks, double jacks, rock drills, wheelbarrows and a variety of rigging gear are used. For frontcountry (non-wilderness) trail work, mechanized equipment (skid steer loaders, small excavators, power wheelbarrows, etc.) may be used if appropriate.

The onsite materials used for these structures are (in order of preference): rocks that are loose and within the trail corridor; rocks close to the trail lying atop the ground; and rocks close to the trail that are partially buried. Any movement of rocks includes subsequent and immediate restoration of the area from which the rock is removed. Where no rock of the appropriate size and shape is available, rocks may be quarried (see Rock Quarrying) or in the case of frontcountry work, purchased or brought in from one of various rock caches within the park. The park Vegetation Specialist will be consulted to ensure that all equipment and materials brought into the park are free of non-native, invasive plants and animals, and noxious weeds. All staff working on site shall be informed of and follow best management practices for preventing the introduction and spread of non-native, invasive species as described in Division 1 Specifications, Section 1335.

Structures are repaired in-kind. For historic structures, this entails using both materials and craftsmanship that meets historic standards as specified in the Secretary of the Interior's Standards for the Treatment of Historic Properties. Logs are sometimes used where no rock is available. The material comes from fallen, standing dead, or live trees (where thick uniform age stands exist and felling will not have an adverse effect on the forest). All stumps are flush cut with the ground and disguised.

Pack and draft stock are used to move the materials to the site of the repairs. Rigging is also used for this purpose. Rocks and trees are used to provide anchors for rigging. Holes may be drilled in rock to support an anchor for rigging. Holes also may be drilled to support for trail structures constructed on slickrock. As discreet a location as possible is chosen for this.

In some instances, minor new off-trail drainages are established, such as those created by water breaks and drainage dips. These are established when the alternative would be a trail reroute, with new impacts to a previously undisturbed area. Natural drainage systems are preserved as much as possible.

Because of their potential to affect natural hydrologic processes, new raised causeways will only be constructed after consultation and approval from the park botanist and park hydrologist. Because of the potential to affect historic landscapes, new raised causeways will also be approved by the park historic landscape architect before construction.

**Rock Removal:** In order to keep the trail corridor clear, the trails program uses a number of techniques to remove rocks that have fallen on the trail:

- Move rocks to the side of the trail using rockbars.
- Move rocks to the side of the trail using mechanized hand winches (grip hoists) to drag the

- rocks out of the corridor.
- Drill rocks with gas or air powered rock drills and split the rocks with steel wedges (plugs and feathers) so that they are more manageable to move by hand or with grip hoists.
  - Drill rocks and use explosives or the boulder buster to break rocks into smaller pieces so that they are more manageable to move by hand or with grip hoists.

Rocking: Rocking involves using rakes and shovels to remove loose unstable rock and branches from the trail tread. Rocking is done primarily where the loose rocks present a hazard or are likely to impede the free flow of water at drainage structures. Rocks are not pulled out of the tread. Materials removed are either scattered out onto the slope below, or are used in trail repair, shortcut blocking, back-filling, or some combination of these. On some trail segments it is necessary to construct inside retaining walls as catch basins for storing/stabilizing this material.

Rock Quarrying: Where building material is unavailable, crews may have to quarry for building stone. In the backcountry, nearby rock sources are used. In the frontcountry, approved rockfall locations and previously stockpiled rock may also be used. See attached list of Staging Areas and Quarrying Locations.

The crews use gas or air powered rock drills for drilling freestanding rocks and then they split the rocks using steel wedges (plugs and feathers) or explosives. Rocks are chosen that are the right size so that all of the rock can be used on the project and no cut rock faces are left behind.

Wildlife specialists will be consulted prior to explosive use, and explosive use will be delayed or avoided if there is any chance that the percussion will have a negative impact on sensitive wildlife in the area (e.g., peregrine falcons).

Safety Railing Repairs and Replacement: This work involves the repair of existing safety railings and fencing of various types at a variety of frontcountry and wilderness locations. This work sometimes includes the drilling of new holes in rock to support replacement sections of railing.

Scaling: Scaling involves the light use of a rake or shovel on the uphill side of the trail to bring down loose rocks and branches that are likely to wash, roll or fall down onto the trail within the following year. These materials are removed so they will not end up impeding the function of drainage structures or become obstacles to trail users. These materials are disposed of by being moved onto the slope below; or by being used in trail repair, shortcut blocking, back-filling, or some combination of these. On some trail segments it is necessary to construct inside retaining walls as catch basins for storing/stabilizing this material.

Sign Repair/Replacement: Work involves installing new signs to replace backcountry trail signs that have been lost or damaged and straightening or resetting existing signs. Only backcountry-type trail signs are covered by this CE. These signs are unpainted metal, made with a torch or plasma cutter. Sign post work requires digging a hole up to 2 feet deep to put the signpost in.

Snow and Ice Control and Removal: Certain trails in Yosemite Valley are plowed and sanded as conditions warrant. Sand used in the park is washed and undergoes a screening process. The park adheres to CalTrans specifications for road sand (available online). Snow removal and sanding operations follow the Winter Snow, Ice, and Tree Removal Standard Operations Procedures, as revised 09-26-2006. A list of trails that are plowed and/or sanded is included in this document (attached).

Staging Areas: Staging areas may be needed to stockpile materials (primarily stone and aggregate base material), especially in frontcountry locations. Location of these areas must be approved by RMS and boundaries must be clearly defined (see attached list of existing and desired Staging Areas and Quarrying

Locations). Staging areas must be localized to job sites to prevent spread of non-natives from one area of the park to another. Pollution prevention measures and erosion control measures must be in effect, and natural features protected from scarring or damage while staging areas are in use. The only soil disturbance that may occur is on the surface. Upon project completion all areas must be restored back to their original condition.

Trail Camps: Wilderness trail camp locations are selected in coordination with RMS and Wilderness Management. At the beginning of the season, work areas and potential camp sites will be identified and sent out to the wilderness manager, park botanist, park wildlife biologist, park hydrologist, park historical landscape architect, and lead park archeologist. Camps for stock use, when necessary, are also subject to this review. Efforts are made to minimize impacts and use acceptable established and previously impacted camps. The following are the major criteria considered when selecting a camp:

- Proximity to trail work sites
- Duration – spike or long-term
- Cultural site clearance (including archeological and cultural landscape considerations)
- Threatened and endangered species, plants or animals (including nesting raptors)
- Previously impacted area
- Distance from water
- Re-supply requirements: Round trip, one-day, or two-day
- Camp elevation for use of fires
- Firewood availability
- Water source, especially late season availability
- Camp size relative to crew size
- Stock use, grazing areas, staging areas, and stock access trails
- Latrine location
- Bear habitat and situation
- Shade
- Relationship to public, possible conflicts
- Visual impact, crew privacy

All trail camp operations will be in compliance with the public health guidelines in *NPS Reference Manual 83: Backcountry Operations*. All ground disturbing activities and cultural resource awareness training will be coordinated through the park Archeology and Anthropology Office.

During any digging for camp setup, workers are made aware that all artifacts are protected by law and that they must stop and let the supervisor know if any artifacts or archeologically sensitive soil layers are found. Botanists are consulted prior to camp establishment to ensure that the camp location does not threaten special status plants or animals.

Crews dig a latrine, dish pit, fire pit (if not already present), and several holes for tent or fly posts. Water is pumped using a solar-powered system, treated with chlorine, and stored in containers. Chainsaw use is minimized and occurs during working hours only. Construction of tables, tent frames, and other structures is minimized, and natural poles (as opposed to ripped or milled) are preferred. Unless an exception is made by the park Wildlife Biologist, all camps will store their food and toiletries in bearproof containers. Overall camp size is minimized as appropriate.

All campsites (including both trail crew and stock support camps) are left thoroughly rehabilitated at the end of their annual need; the zone of impact is reduced. Every effort is made so that no cut rounds, and minimal cut firewood, are left for the public. Only a minimal rock fire pit may be left at appropriate sites.



Trail Delineation: In areas where there are problems with trail visibility or where the trail width is a concern, trails are delineated with cairns, border rocks, and/or border/barricade logs. Social trails, shortcuts, and trail braids may be disguised using branches, duff, or rocks. Temporary cedar split rail fencing may be installed in locations where shortcutting is a major resource damage concern. The temporary fencing will be removed when the vegetation in the area has recovered.

Tread Repair: This activity involves maintaining the integrity of the trail tread by replacing material that has eroded from the trail. Material is obtained from the outside berm of the trail or the clearing of drainages. Where a substantial amount of material has eroded from the trail, creating ruts, material (including aggregate base for non-wilderness areas) may need to be brought in with stock or mechanized equipment (non-wilderness only) in order to backfill the ruts.

For mortared/cemented trail tread, the cement/mortar should be removed and stone tread (rip rap) of appropriate dimension should be embedded into the trail surface. This historic method will improve drainage over stones mortared in place, reducing maintenance need. All material brought in for tread repair will be approved by resource specialists to ensure materials are free from invasive plant seeds or other propagules. Replacement materials brought in will be approved by a park Historical Landscape Architect for color match and to otherwise ascertain that the material conveys appropriate historic character.

Tree Removal: Trees that interfere with the trail corridor are considered for removal. This includes downed trees, leaners, and trees that will interfere with the integrity of the trail corridor in the near future.

Downed trees are cut to a width which allows enough space for the user group of any given trail segment to pass easily and safely. Cut rounds are rolled off the trail on the downhill side.

Waste Removal:

Treated lumber will be transported outside the park and disposed of with an approved landfill or co-generation plant.

Project Locations:

Mariposa County, CA  
Tuolumne County, CA  
Madera County, CA

Mitigations:

- **Coordinate activities with park Archeologist and the park American Indian Liaison to ensure protection of cultural resources.**
- **Adhere to the Mitigation Measure table in Attachment A.**

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):

**C.3 Routine maintenance and repairs to non-historic structures, facilities, utilities, grounds and trails.**

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.

Acting Park Superintendent //Dennis Schramm//

Date 10/28/09

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



National Park Service  
U.S. Department of the Interior

Yosemite NP  
Date: 07/07/2009

**ENVIRONMENTAL SCREENING FORM (ESF)  
DO-12 APPENDIX 1**

Updated May 2007 - per 2004 DM revisions and proposed DO-12 changes

Today's Date: **July 28, 2009**

Date Form Initiated: **July 28, 2009**

**A. PROJECT INFORMATION**

Park Name: **Yosemite NP**

Project Title: **2007-007 Programmatic Parkwide Trail Routine Maintenance and Repair 2009-2013**

PEPC Project Number: **22757**

Project Type: **Facility Maintenance (FM)**

Project Location:

County, State: **Mariposa, California** District: **Parkwide**  
County, State: **Tuolumne, California** District: **Parkwide**  
County, State: **Madera, California** District: **Parkwide**

Project Leader: **Tony Brocchini**

Background information attached? **Yes**

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.		X			Trail maintenance includes negligible ground disturbing activities.
2. From geohazards	X				
3. Air quality		X			Some trail work includes the use of rock hammers that emit temporary granite dust.
4. Soundscapes		X			There are some temporary equipment noises associated with the trails program. All blasting activities will follow guidelines in NPS Director's Order 65:

					Explosives Use and Blasting Safety and the National Park Service Handbook for the Storage, Transportation, and Use of Explosives.
5. Water quality or quantity	X				
6. Streamflow characteristics	X				
7. Marine or estuarine resources	X				
8. Floodplains or wetlands	X				
9. Land use, including occupancy, income, values, ownership, type of use	X				
10. Rare or unusual vegetation – old growth timber, riparian, alpine	X				
11. Species of special concern (plant or animal; state or federal listed or proposed for listing) or their habitat		X			The trails program will consult with the appropriate subject matter experts in the park Resources Management and Science division when maintenance activities could occur in an area that may affect sensitive wildlife, including nesting birds, or when potential to disrupt wildlife exists.
12. Unique ecosystems, biosphere reserves, World Heritage Sites		X			Yosemite National Park is a World Heritage Site; no historic properties would be adversely affected by implementing this project.
13. Unique or important wildlife or wildlife habitat	X				
14. Unique or important fish or fish habitat	X				
15. Introduce or promote non-native species (plant or animal)		X			See Comment 1, below.
16. Recreation resources, including supply, demand, visitation, activities, etc.	X				
17. Visitor experience, aesthetic resources	X				The visitor experience will be enhanced by the improved trails throughout the park.
18. Archeological resources		X			Establishment of trail camps requires archeological clearance to

					identify potential to affect archeological sites and appropriate treatment measures.
19. Prehistoric/historic structure		X			Rebuilding of all historic structures will require case by case review by the appropriate subject matter experts in Resources Management and Science, including historical landscape architect, historic architect, and archeologist. All rebuilding will require before and after photo documentation.
20. Cultural landscapes		X			Consultation with park History, Architecture, and Landscapes Branch and Historic Preservation staff on trail maintenance activities near sites with historic cultural significance.
21. Ethnographic resources		X			
22. Museum collections (objects, specimens, and archival and manuscript collections)	X				
23. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure	X				
24. Minority and low income populations, ethnography, size, migration patterns, etc.	X				
25. Energy resources	X				
26. Other agency or tribal land use plans or policies	X				
27. Resource, including energy, conservation potential, sustainability	X				
28. Urban quality, gateway communities, etc.	X				
29. Long-term management of resources or land/resource productivity	X				
30. Other important environment resources (e.g. geothermal,	X				

paleontological resources)?					
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Comments:

**To avoid spread of non-native, invasive plant and animal species, all fill, mulch, reseeding, and sod material brought into the park must be free of non-native, invasive plants and animals, and noxious weeds. All staff working on site shall be informed of, and follow best management practices for preventing the introduction and spread of non-native, invasive species as described in Division 1 Specifications, Section 1335 and the Invasive Plant Management Plan for Yosemite National Park.**

### 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?		X		
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?		X		Mitigated; the assessment of effect is "No Adverse Effect."
C. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA section 102(2)(E))?		X		
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?		X		
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?		X		
F. Have a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects?		X		
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?		X		

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?		X		
I. Violate a federal law, or a state, local, or tribal law or requirement imposed for the protection of the environment?		X		
J. Have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898)?		X		
K. Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007)?		X		
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)?		X		See Comment 1, above.

For the purpose of interpreting these procedures within the NPS, any action that has the potential to violate the NPS Organic Act by impairing park resources or values would constitute an action that triggers the DOI exception for actions that threaten to violate a federal law for protection of the environment.

**D. OTHER INFORMATION**

Are personnel preparing this form familiar with the site? **Yes**

Did personnel conduct a site visit? **Yes, trail assessments completed on an annual basis.**

Is the project in an approved plan such as a General Management Plan or an Implementation Plan with an accompanying NEPA document? **No**

Is the project still consistent with the approved plan? **N/A**

Are there any interested or affected agencies or parties? **No**

Has consultation with all affected agencies or tribes been completed? **No**

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**

<b>Interdisciplinary Team</b>	<b>Field of Expertise</b>
David V. Uberuaga	Acting Superintendent
Jim Hammett	Acting Deputy Superintendent
Kristina Rylands	Acting Chief of Planning
Mark Butler	Chief of Project Management
Katariina Tuovinen	Chief of Administration Management
Dennis Mattiuzzi	Chief of Facilities Management
Niki Nicholas	Chief of Resources Management & Science
Marty Nielson	Chief of Business and Revenue Management
Tom Medema	Acting Chief of Interpretation and Education
Steve Shackelton	Chief Ranger
Tony Brochini	Project Leader
Elexis Mayer	Environmental Planning and Compliance Program Manager
Jeannette Simons	NHPA Specialist
Renea Kennec	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:

<b>Compliance Specialists</b>	<b>Date</b>
<u>//Renea Kennec//</u> Compliance Specialist – Renea Kennec	<u>9/18/09</u>
<u>//Elexis Mayer//</u> Compliance Program Manager – Elexis Mayer	<u>10/13/09</u>
<u>//Mark A. Butler//</u> Chief, Project Management – Mark Butler	<u>10/19/09</u>

Approved:

<b>Acting Superintendent</b>	<b>Date</b>
<u>//Dennis Schramm//</u> David V. Uberuaga	<u>10/28/09</u>

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





## ASSESSMENT OF ACTIONS HAVING AN EFFECT ON CULTURAL RESOURCES

### A. DESCRIPTION OF UNDERTAKING

1. Park: **Yosemite NP** Park District: **Parkwide**

2. Project Description:

a. Project Name: **2007-007 Programmatic Parkwide Routine Trail Maintenance and Repair 2009-2013** Date: **April 8, 2009** PEPC Project ID Number: **22757**

b. Describe project and area of potential effects (as defined in 36 CFR 800.2[c])

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

No

Yes, Source or reference: **Park-wide APE. The presence or absence of historic properties to be determined on a case by case basis.**

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 cultural deposits.)

4. Potentially Affected Resource(s):

Archeological resources affected?

Name and number(s): **Park-Wide permit; presence/absence of resources determined on a site by site basis.**

Historical structures/resources affected?

Name and number(s): **Park-Wide permit; presence/absence of resources determined on a site by site basis.**

Ethnographic resources affected?

Name and number(s): **Park-Wide permit; presence/absence of resources determined on a site by site basis.**

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

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

**Yes** Replace historic features/elements in kind

**Yes** Add non-historic features/elements to a historic structure

**Yes** Alter or remove features/elements of a historic setting or environment (inc. terrain)

**Yes** Add non-historic features/elements (inc. visual, audible, or atmospheric) to a historic setting or cultural landscape

- No Disturb, destroy, or make archeological resources inaccessible  
No Disturb, destroy, or make ethnographic resources inaccessible  
Yes 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. Measures to prevent or minimize loss or impairment of historic/prehistoric properties:  
(Remember that setting, location, and use may be relevant.)

- **Coordinate activities with the park Archeology and the park Native American Liaison to ensure protection of cultural resources.**

7. Supporting Study Data:

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

8. Attachments:

- Maps  Archeological survey, if applicable  Drawings  Specifications  Photographs  
 Scope of Work  Site plan  List of Materials  Samples  Other:

Prepared by: **Jeannette Simons** Date: **April 8, 2009** Title: **Historic Preservation Officer** Telephone: **209-379-1372**

## **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: 03/30/2009  
Comments: YOSE 1999 PA, Stipulation VII.C.2.

*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**

---

Historical Architect  
Name: Sueann Brown  
Date: 04/07/2009  
Comments:

*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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Historian  
Name: Patrick Chapin  
Date: 03/26/2009  
Comments: None

*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: **None**

106 Advisor  
Name: Jeannette Simons  
Date: 04/08/2009  
Comments:

*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:

**Implement required Mitigation Measures in the 2009-2013 Programmatic Parkwide Trail Routine Maintenance and Repair Project Description, and Mitigation Table in Appendix A.**

Doc Method: **Park Specific Programmatic Agreement**

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Anthropologist  
Name: Jeannette Simons  
Date: 04/08/2009  
Comments: American Indian Liaison

*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:

**Coordinate activities with the American Indian Liaison to determine potential impact to traditional cultural resources.**

Doc Method: **Park Specific Programmatic Agreement**

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Historical Landscape Architect  
Name: David Humphrey  
Date: 02/24/2009  
Comments: None.

*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: **None.**

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No Reviews From: **Curator, Other Advisor**

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

1. Assessment of Effect:

No Historic Properties Affected  No Adverse Effect  Adverse Effect

2. Compliance requirements:

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: \_\_\_\_\_

E. COMPLIANCE REQUIREMENTS SATISFIED BY USE OF NEPA

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. STIPULATIONS/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.

Recommended by Park Section 106 coordinator:

Signature of Historic Preservation Officer  //Jeannette Simons//

Date:  8/24/09

**D. 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.

Signature of Acting Superintendent  //Dennis Schramm//

Date:  10/28/09

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

## PARK ESF ADDENDUM

Today's Date: **July 28, 2009**

### PROJECT INFORMATION

Park Name: Yosemite NP

Project Number: 22757

Project Type: Facility Maintenance (FM)

Project Location: County, State: Mariposa, California District: Parkwide

County, State: Tuolumne, California District: Parkwide

County, State: Madera, California District: Parkwide

Project Manager: Tony Brocchini

Project Title: 2007-007 Programmatic Parkwide Trail Routine Maintenance and Repair 2009-2013

### PARK ESF ADDENDUM QUESTIONS & ANSWERS

ESF Addendum Questions	Yes	No	N/A	Data Needed to Determine/Notes
1. SPECIAL STATUS SPECIES CHECKLIST				
2. Listed or proposed threatened or endangered species (Federal or State)?		X		
3. Species of special concern (Federal or State)?		X		
4. Park rare plants or vegetation?		X		
5. Potential habitat for any special-status species listed above?		X		
6. NATIONAL HISTORIC PRESERVATION ACT CHECKLIST				
7. Entail ground disturbance?	X			Trail maintenance includes negligible ground disturbing activities. In the event that previously unknown cultural resources are encountered during routine maintenance, trails staff will temporarily suspend work in the immediate area and contact RMS to evaluate the materials and determine appropriate action.
8. Are any archeological or ethnographic sites located within the area of potential effect?	X			Parkwide.
9. Entail alteration of a historic structure or cultural landscape?	X			Rebuilding of all historic structures will require case by case review by the appropriate subject matter experts in Resources Management and Science, including historical landscape architect, historic architect, and archeologist.
10. Has a National Register form been completed?			X	

11. Are there any structures on the park's List of Classified Structures in the area of potential effect?	X			Many bridges and bridge abutments are on the LCS.
12. WILD AND SCENIC RIVERS ACT CHECKLIST				
13. Fall within a wild and scenic river corridor?	X			Merced and Tuolumne Rivers.
14. Fall within the bed and banks AND will affect the free-flow of the river?		X		
15. Have the possibility of affecting water quality of the area?		X		
16. Remain consistent with its river segment classification?			X	
17. Protect and enhance river ORVs?			X	
18. Fall within the River Protection Overlay?		X		
19. If Yes, remain consistent with conditions of the River Protection Overlay?			X	
20. Remain consistent with the areas Management Zoning?			X	
21. Fall on a tributary of a Wild and Scenic River?	X			Parkwide.
22. Will the project encroach or intrude upon the Wild and Scenic River corridor?	X			Some bridge work will occur in the river corridor but only on a temporary basis.
23. Will the project unreasonably diminish scenic, recreational, or fish and wildlife values?		X		
100. WILDERNESS ACT CHECKLIST				
101. Within designated Wilderness?	X			Only non-routine projects not included in this CE will require a Minimum Requirement Analysis, per the Wilderness Office.
102. Within a Potential Wilderness Addition?	X			

Attachment A

Topic	Mitigation Measures	Timeframe
General Resource Management	Minor trail reroutes require case-by-case review by appropriate subject-matter experts in the Resources Management and Science Division (RMS) and Wilderness Management. Major trail reroutes are not covered under this categorical exclusion.	Prior to project activities
	Because of their potential to affect natural hydrologic processes, vegetation, and historic landscapes, new raised causeways will only be constructed after consultation with appropriate subject-matter experts from RMS.	Prior to project activities
	Establishment of trail camps, including camps for stock use, requires consultation with the appropriate subject-matter experts in RMS and Wilderness Management.	Prior to project activities
	Location of staging areas must be reviewed by RMS and boundaries must be clearly defined. Staging areas must be localized to job sites to prevent spread of non-native, invasive species from one area of the park to another. Pollution prevention measures and erosion control measures must be in effect, and natural features protected from scarring or damage while staging areas are in use. The only soil disturbance that may occur is on the surface. Upon project completion all areas must be restored back to their original condition.	Prior to and concurrent with project activities
Natural Resources	To avoid the spread of non-native, invasive plant and animal species, all fill, mulch, reseeding, and sod material brought into the park must be free of non-native, invasive plants and animals, and noxious weeds. All staff working on site shall be informed of, and follow best management practices for preventing the introduction and spread of non-native, invasive species as described in Division 1 Specifications, Section 1335 and the <i>Invasive Plant Management Plan</i> for Yosemite National Park.	Prior to project activities
	The trails program will consult with the division liaison and appropriate subject-matter experts in RMS when maintenance activities could occur in an area that may affect sensitive wildlife, including nesting birds, or when potential to disrupt wildlife exists.	Prior to project activities
	The trails program will consult with the division liaison and appropriate subject-matter experts in RMS prior to explosive use, and explosive use will be delayed or avoided if there is any chance that the percussion will have a negative impact on sensitive wildlife in the area (e.g., peregrine falcons).	Prior to project activities
	The trails program will consult with the division liaison and appropriate subject-matter experts in RMS when	Prior to project activities



Attachment A

	maintenance activities could occur in an area that may affect special status species.	
Cultural Resources	Consultation will occur with History, Architecture and Landscapes Branch (HAL) and Historic Preservation staff on trail maintenance activities near sites with historic cultural significance.	Prior to project activities
	Replacement materials brought in for tread repair will be evaluated by a park historical landscape architect for color match and to otherwise ascertain that the material conveys appropriate historic character	Prior to project activities
	Establishment of trail camps requires archeological clearance to identify potential to affect archeological sites and appropriate treatment measures, including at previously disturbed locations.	Prior to project activities
	Trail crew leaders will attend refresher sessions with archeologists to review the protection of archeological resources at beginning of each season, and all employees are made aware that all artifacts are protected by law and that if any archeologically sensitive soil layers are found, digging must stop at once and the supervisor or leader must be informed.	Prior to project activities
	Per historic preservation stipulations, work involving bridge or boardwalk approach, abutment, pier, or stringer repair/replacement will be cleared with appropriate subject-matter experts in RMS, including historic preservation staff, before repairs begin and will be performed with evaluation of RMS and historic preservation staff. New construction is not covered by this categorical exclusion.	Prior to and concurrent with project activities.
	Rebuilding of all historic structures will require case-by-case review by the appropriate subject matter experts in RMS, including historical landscape architect, historic architect, and archeologist. All rebuilding will require before and after photo documentation.	Prior to and concurrent with project activities
	Although not expected, should previously unknown American Indian burial sites be discovered during routine trail maintenance, provisions outlined in the Native American Graves Protection and Repatriation Act and its implementing regulations will be followed.	Concurrent with project activities
	In the event that previously unknown cultural resources are encountered during routine trail maintenance, trails staff will temporarily suspend work in the immediate area and contact RMS to evaluate the materials and determine appropriate action.	Concurrent with project activities
Wilderness Management	Trail crew sizes are limited to 15 or less.	Prior to project activities

Attachment A

	All non-routine projects not included in this Categorical Exclusion require a Minimum Requirement Analysis. Any helicopter support must be evaluated on a project by project basis by Wilderness Management and requires a supplemental Minimum Tool Requirement Analysis.	Prior to project activities
	Establishment of trail camps, including camps for stock use, in wilderness requires consultation with Wilderness Management and RMS staff.	Prior to project activities
	Minor trail reroutes require case-by-case review by appropriate subject-matter experts in RMS and Wilderness Management. Major trail reroutes are not covered under this CE.	Prior to project activities
Operations	Sand used in the park will be washed and undergo a screening process. The park adheres to CalTrans specifications for road sand (available online). Snow removal and sanding operations on trails follow the Winter Snow, Ice, and Tree Removal Standard Operations Procedures, as revised 09-26-2006.	Prior to project activities
	All trail camp operations will be in compliance with the public health guidelines in <i>NPS Reference Manual 83: Backcountry Operations</i> .	Prior to and concurrent with project activities
Visitor Protection Measures	All blasting activities will follow guidelines in <i>NPS Director's Order 65: Explosives Use and Blasting Safety and the National Park Service Handbook for the Storage, Transportation, and Use of Explosives</i> . In order to provide for public safety, trails will be closed by trail crews for the duration of blasting operations. The crew will alert dispatch at the beginning and the end of all blasting operations. A note of the trail closure will be posted at all pertinent trailheads and the Public Information Office will be notified. For large blasts that will be heard in Yosemite Valley, the Yosemite Medical Clinic will also be notified. The Blaster in Charge will assign workers to establish a secure perimeter around the blast site in order to prevent people from wandering into the blast area. The Blaster in Charge will maintain contact with his security detail by voice and radio.	Prior to and concurrent with project activities

## Attachment A

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### **Definitions of Structures Repaired, Maintained and Constructed:**

Boardwalks – Low bridges in wet areas that protect the plants and hydrologic flow by elevating foot traffic. Generally are low enough that they don't require railings.

Bridge Abutment – Dry or wet (mortared) stone walled structure. Generally 3 walls (upstream, downstream, and parallel with stream) to hold fill, protect the riverbank and support the bridge stringers. May have a cement pad poured on the top for the bridge stringers to rest on. For smaller bridges the abutment may be constructed from native logs. Work will be cleared with historic preservation staff before repairs begin.

Bridge Approaches – Walls, steps, and riprap built to allow the trail to meet the deck of the bridge.

Bridge Decking – Lumber fastened to the stringer and used as the walking surface for the bridge. Usually 3" x 12" pressure treated boards.

Bridge Pier – A 4 sided stone structure (wet or dry) built in the stream/riverbed to support the bridge stringers midspan. Work will be cleared with historic preservation staff before repairs are started.

Bridge Railing – Lumber used to protect stock and hikers from falling off the bridge.

Bridge Stringer – Steel, Magnesium, Aluminum, Milled Wood, and Native Log beams used to span the stream or river. Work will be cleared with historic preservation staff before repairs are started.

Terrace Step – A stone or wooden structure laid perpendicular to or across the trail to retain soil and gain elevation.

Retaining Wall – Stone or wooden structure laid parallel to the outside or the inside of the trail to retain soil, trail tread or to keep material from sloughing into the trail. Retaining walls can be single tier or multiple tiers.

Causeway – An elevated section of trail which is laid over a wet or eroded section, usually having rock or log outer walls holding crushed rock fill and covered with soil or other tread material. The crush filled base allows for water movement through the structure.

Waterbreak – Rock or wooden structure laid out across the trail tread at an angle which turns water running down the trail off the trail to the downhill side. May also include a drainage ditch to allow the water to run clear of the trail.

Swales or Drainage Dip – Dip in the tread surface dug at an angle to the trail which turns the water running down the trail off the trail on the downhill side. The downslope side of the dip is mounded with soil removed from the trail tread (for the dip) and the drainage ditch. May also include a drainage ditch to allow the water to run clear of the trail.

## Attachment A

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Riprap (Stone Paving Trail Tread) – Interlocking rocks laid as trail tread. Used to climb steep grades or in areas where water runs on the trail.

Culverts – Steel, cement or stone passages allowing water to flow under the trail surface.

Fords – A constructed trail crossing of a stream. Depending on the situation, fords may include terraces steps, riprap, stepping stones and wall.

Mortared/cemented Trail Tread – Several situations in the park have trail tread where stones have been cemented or mortared in place. Other locations have cement tread. Some of these locations get high water flows and are very difficult to maintain with any other trail tread surface.

Step Stones – Stones placed an even distance apart to allow hikers to cross wet areas.

Trail Directional Signs – Metal signs on metal posts giving mileages and directions at trail intersections.

### **Staging Areas and Quarrying Locations**

#### Existing:

Wawona Maintenance Yard – staging area

Pohono Pit – staging and traditional quarry/rock stockpile location

Yosemite Valley Woodyard – staging area

Yosemite Valley Maintenance Yard – staging area

Upper and Lower South Landing – staging area and traditional rock stockpile containing old useable rock

El Portal Sand Pit – approved location to collect old stockpiled rock, no new stockpiling/staging allowed

Three Brothers – approved location to collect fallen rock

#### Desired:

Yosemite Valley Wilderness Parking and/or Camp 6 Day Use Parking – would like to use as staging area

Happy Isles – would like to collect fallen rock from Glacier Point area rockfalls

Upper May Lake Pit – would like to use a staging area for backcountry use

Chinquapin – would like to use as a staging area

Ostrander Trailhead area – old quarrying/stockpile location from Glacier Point Road construction – would like to use as both a staging area and use previously quarried rock.

White Wolf – would like to use as a staging area