

# Appendix L: Class C Net Construction Cost Estimates for Implementing the Tuolumne Wild and Scenic River Comprehensive Management Plan

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Class C construction cost estimates are conceptual cost estimates prepared with “big-picture” scopes of work. They are general in nature, representative of a broad-based vision rather than focused on specific details. The National Park Service typically creates Class C construction cost estimates for large-scale planning efforts such as general management plans and wild and scenic river comprehensive management plans. These Class C construction cost estimates are based on a combination of detailed installation analysis, typical assembly costs, lump sum and unit costs derived from similar projects.

The Class C net construction cost estimates for the *Tuolumne River Plan* were prepared by professional cost estimators from the National Park Service, Denver Service Center, Technical Services Branch in 2011. Cost data was compiled from *RS Means 2011 Building Construction Cost Data, Site Work and Landscape Cost Data, and Square Foot Costs Data*. In addition, some cost information was derived from recently completed Yosemite National Park projects and similar projects at other parks.

Implementation of the selected alternative for the *Tuolumne River Plan* would occur in phases over a period of several years. Cost estimates for each individual phase will be refined (i.e., Class B and Class A) in tandem with the design development process.

For detailed information pertaining to cost estimating standards, refer to the National Park Service *Cost Estimating Requirements Handbook* (NPS 2011):

[www.nps.gov/dscw/loader.cfm?csModule=security/getfile&PageID=297684](http://www.nps.gov/dscw/loader.cfm?csModule=security/getfile&PageID=297684)

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<b>Class C Net Construction Cost Estimate for Implementing the Tuolumne River Plan</b>				
<b>Location</b>	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4 (NPS preferred)</b>
1. Pothole Dome	228,903	465,316	382,418	465,316
2. Tioga Road through Tuolumne Meadows area	6,060,950	6,991,446	6,138,950	6,991,446
3. Existing Cathedral Lakes trailhead	246,394	246,394	246,394	246,394
4. Existing wastewater ponds and sprayfield	2,686,444	365,873	365,873	375,147
5. Area east of Budd Creek and west of existing visitor center	210,927	5,576,759	210,927	210,927
6. Existing visitor center and Road Camp	1,052,275	1,562,298	1,478,556	3,477,310
7. Existing wastewater treatment plant	4,392,455	5,015,304	9,180,709	5,432,953
8. Parsons Memorial Lodge	761,847	228,890	228,890	228,890
9. Area west of Unicorn Creek	323,160	1,295,836	315,676	7,417,275
10. Tuolumne Meadows Campground area	11,938,248	16,365,915	13,943,866	16,177,635
11. Existing commercial services core	3,114,506	12,065,015	1,454,740	3,272,812
12. Existing concessioner stable	1,870,888	1,116,404	203,495	2,033,888
13. Lumbert Dome	955,539	1,247,303	1,357,736	1,357,736
14. Old Tioga Road/Great Sierra Wagon Road	763,641	763,641	763,641	763,641
15. Existing wilderness center and NPS stable	6,155,974	1,271,358	851,420	1,257,858
16. Existing ranger station and Ranger Camp	2,353,064	2,695,225	2,612,997	5,338,665
17. Bug Camp, Dog Lake/John Muir Trail parking	1,534,011	1,534,011	3,147,718	3,301,324
18. Tuolumne Meadows Lodge	1,161,617	232,090	4,156,879	4,062,741
19. Water treatment facility	175,000	1,250,000	1,250,000	1,250,000
20. Gaylor Pit	112,122	9,587,798	218,515	765,000
21. Glen Aulin High Sierra Camp	912,862	1,106,774	1,152,525	1,152,525
<b>PROJECTED TOTAL COST</b>	<b>\$47,010,827</b>	<b>\$70,983,650</b>	<b>\$49,661,925</b>	<b>\$65,579,483</b>

# Appendix M:

## Cumulative Plans and Projects List

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This appendix presents a summarized list and subsequent detailed descriptions of past, present, and reasonably foreseeable projects that have been evaluated in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular resource. These projects were included in the cumulative effects analysis presented in Chapter 7 of this document.

The National Park Service plans and projects listed in this appendix can be accessed through the agency's Planning, Environment and Public Comment website at: <http://parkplanning.nps.gov/>.

## Summary

### Reasonably Foreseeable Actions

There are no reasonably foreseeable actions that could potentially affect the Tuolumne River corridor at this time.

### Current Actions

#### **National Park Service**

- Cathedral Peak Route Delineation
- Commercial Use Authorization for Commercial Activities
- Hetch Hetchy Communication System Upgrade Project
- High-Elevation Aquatic Ecosystem Recovery and Stewardship Plan
- Improve Parkwide Communications Data Network
- Informal Trail Removal and Ecological Restoration Actions at Tuolumne Meadows
- Invasive Plant Management Plan Update
- Merced Wild and Scenic River Comprehensive Management Plan
- Operational Fire Management Plan
- Sierra Nevada Bighorn Sheep Environmental Assessment (Sequoia and Kings Canyon National Parks)
- Scenic Vista Management Plan
- Tenaya Lake Area Plan
- Tioga Road Rehabilitation Project
- Tioga Road Corridor Campground Accessibility Improvements
- Tioga Trailheads Project
- Tuolumne Meadows Upgrade Shuttle Stop Signs
- Tuolumne Meadows Concessioner Stables Fence Modification
- Tuolumne Meadows Water Treatment System Improvements
- Vegetation Management Plan
- Wilderness Stewardship Plan

#### **Other Agencies**

- National Forest Travel Management Plan and Forest Plan Revisions
- Recreational Facility Analysis (U.S. Forest Service)

## **Past Actions**

### **National Park Service**

- Fire Management Plan
- Tuolumne Meadows Water Treatment Facility Regulatory Upgrade
- Gaylor Pit Lead Abatement
- Restoration of Disturbed Areas at Tuolumne Meadows Lodge
- Tuolumne Meadows Service Station Soil Gas Survey
- Tuolumne Meadows Service Station Vapor Recovery Installation
- Tuolumne Meadows Water Line Replacement
- Tuolumne Winter Ranger Residence Install Alternative Power Sources
- Pate Valley and Yosemite Valley Invasive Velvet Grass Control

### **Other Agencies**

- Grazing Allotment Permit Renewals (U.S. Forest Service)
- O'Shaughnessy Diversion Tunnel Flap Gate Clearing Project (San Francisco Public Utilities Commission)
- Upper Tuolumne River Ecosystem Project - O'Shaughnessy Dam Instream Flow Evaluation Study Plan (San Francisco Public Utilities Commission)
- Water System Improvement Program (San Francisco Public Utilities Commission)

## **Reasonably Foreseeable Actions**

There are no reasonably foreseeable actions that would potentially affect the Tuolumne River corridor at this time.

## **Current Actions or Plans**

Agency Name: National Park Service, Yosemite National Park

Project Name: Cathedral Peak Route Delineation

Description: Cathedral Peak has long been a popular destination for both climbers and adventure hikers. After decades of consistent use, severe erosion, extensive informal trail networks, gullies caused by "scree skiing," loose footing, and major vegetation loss characterize the final quarter-mile of the approach, as well as the descent back to the base. These impacts have only accelerated over the last few years as several new guidebooks promote the peak as a "classic," "easy" introduction to Sierra climbing.

This project proposes to delineate one path from the junction of the Budd Lake Fisherman's trail to the base of the south east face of Cathedral Peak, as well as a single descent path from the north ridge of the summit back to the base. By delineating one path and using extensive ecological restoration, the multiple social trails would be restored to natural conditions.

Project implementation began in 2010 and is ongoing.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Commercial Use Authorizations for Commercial Activities**

Description: The purpose for the issuance of these Commercial Use Authorizations (CUA, previously titled Incidental Business Permit) is to regulate and oversee operations of permit holders involved in conducting commercially guided day hiking, overnight backpacking, fishing, photography workshops, stock use (pack animal trips and pack support trips for hikers), and Nordic skiing activities in Yosemite National Park. In addition to the base CUA, additional uses and activities may be allowed depending on the holder's request and compliance with all applicable laws, regulations and guidelines. Conditions for these additional activities are stipulated in the body of the individual permit for each activity. The permitted activities are to be conducted only in those areas of Yosemite National Park open to the public and authorized by the permit. The permit holder is required to obtain any additional permits or licenses as required by law. Permits are renewed annually.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Hetch Hetchy Communication System Upgrade**

Description: The San Francisco Public Utilities Commission in cooperation with the National Park Service and The US Forest Service is planning a communication system upgrade project. The purpose of the upgrade project is to 1) vacate the 2GHz band per Federal Communications Commission requirements; 2) replace and upgrade the obsolete and aging communication system with an improved system; 3) provide the video and radio bandwidth to allow for future installation of voice radio system; 4) provide the foundation infrastructure for housing NPS and USFS communication equipment associated with their individual communications systems.

Project implementation and construction began in summer 2011.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **High-Elevation Aquatic Ecosystem Recovery and Stewardship Plan**

Description: The National Park Service is preparing a High-Elevation Aquatic Resources Management Plan to guide management actions to protect Yosemite's diverse high-elevation aquatic ecosystems and to restore natural composition, structure, and function to systems that have been disturbed by past or ongoing human activities. The plan is needed to provide a framework for restoring and maintaining high-elevation aquatic ecosystems in the park; to halt the decline of native amphibian populations and to restore species within their natural range; and to prepare for new challenges that may threaten these systems. The plan will include the lakes, ponds, wet meadows, and streams located above 6,000 feet in elevation and the diverse plants and animals that inhabit these environments.

The plan will consider: 1) Removal of non-native fish from targeted areas of the park to restore natural biodiversity in critical basins (chemical removal of non-native fish is not currently being considered in this plan); 2) Restoration of Sierra Nevada yellow-legged frogs and Yosemite toads to suitable locations within their

historic range; and 3) The development of Best Management Practices for recreational and administrative use of high-elevation aquatic ecosystems to ensure that park resources and values remain unimpaired. These would include preventative measures to avoid the introduction or spread of non-native species or pathogens that may threaten native species or habitats, and evaluation of human use within these environments to ensure that use does not result in the loss of ecological function.

Project planning and preparation of an environmental assessment is underway and is scheduled for public review in 2012.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Informal Trail Removal and Ecological Restoration Actions at Tuolumne Meadows**

Description: This project proposes to protect the meadow through restoring trampled areas of the meadow, removing informal trails and delineating trails and trailheads using logs, rocks, or fencing. Cultural resources will be documented for future restoration projects. The following actions for 2012 are scheduled in portions of the meadows (not all of the meadows will be treated):

- Remove informal trails in Tuolumne Meadows (the section from the Tuolumne Store and Grill to the bridge/Soda Springs area will not be removed) to restore hydrologic conditions and native plant communities
- Close sections of Tuolumne Meadows to protect restoration areas and prevent additional informal trailing.
- Delineate trails with logs or rocks around the Soda Springs area to reduce meadow fragmentation and damage to rare plant habitat
- Delineate trail and parking at the Soda Springs trailhead with logs, rocks or fencing
- Conduct site visits with subject matter experts of several divisions to prioritize, identify data gaps and develop methods for future work
- Develop interpretive materials to inform visitors of the project and the importance of protecting meadow habitat
- Conduct preliminary vegetation, wildlife, hydrology and visitor use monitoring to measure efficacy of proposed future restoration actions

A categorical exclusion for this project was completed in spring 2012, and project implementation is expected to occur in summer 2012.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Invasive Plant Management Plan Update**

Description: This plan is based upon the principles of integrated pest management and describes the tools and methods use to protect Yosemite's natural and cultural resources from degradation or displacement by non-native invasive species. This plan update was written to comply with the Wild and Scenic Rivers Act, including protection of outstandingly remarkable values and water quality. A methodology will also be created for assessing the efficacy and impacts of new herbicides, and assessing various management guidelines and tools.

An environmental assessment completed for this project and released for public review in 2010. A finding of no significant impact was approved by the NPS Regional Director in August 2010. Project implementation is underway.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Improve Parkwide Communications Data Network**

Description: Yosemite National Park plans to begin a Communications Data Network (CDN) infrastructure upgrade utilizing available, commercial off-the-shelf technology supporting a single "hybrid communication backbone" employed throughout the park -- to maximize existing equipment use, minimize current and planned costs, to fulfill the park's future operational and security needs. This "backbone" will be a microwave and fiber optic pipeline used to transfer computer LAN data, radio communications, security and safety video systems, telephony, burglar/intrusion, fire alarm systems, traffic collection data, and telemetry throughout Yosemite. Upgrading the network also serves to enhance compliance and utilization of the narrowband and digital P25 compliant radio infrastructure as well as providing enhanced LAN connectivity for remote areas such as Wawona, Crane Flat, Hodgdon Meadows, and Tuolumne Meadows.

The CDN is designed to serve six geographic areas of the park as well as the five park entrance stations. The geographic areas include El Portal, Yosemite Valley, Wawona, Crane Flat, Hodgdon Meadows, Tuolumne Meadows, and Hetch Hetchy. The final installation will be a hybrid infrastructure, based around proven microwave technology that linking the geographic areas with multiple T-3 level bandwidth managed as necessary by park staff. There will be no need to rely on an independent service provider for maintenance of the system, as the backbone will be maintained by park staff.

An environmental assessment completed for this project and released for public review in 2010. A finding of no significant impact was approved by the NPS Regional Director in April 2010. Project implementation is underway in the Crane Flat area.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Merced Wild and Scenic River Comprehensive Management Plan**

Description: The NPS has begun developing a new Comprehensive Management Plan and associated Environmental Impact Statement for the Merced Wild and Scenic River (Merced River Plan/EIS). In this plan, the agency will address resource protection and restoration; development (and/or removal) of lands and facilities; user capacities; and specific management measures that will be used to protect and enhance the river's outstandingly remarkable values. The Merced River Plan/EIS will address the quantity and mixture of recreation and other public uses that may be permitted without adverse impact to the river's outstandingly remarkable values, including a discussion of the maximum number of people that may be received in the river corridor.

The National Park Service is currently preparing a new comprehensive river management plan and environmental impact statement for the Merced Wild and Scenic River within Yosemite National Park.

Public scoping was reopened for the new plan in July and August 2009. Preparation of the environmental impact statement is underway and is scheduled for public review in 2012.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Operational Fire Management Plan**

Description: Yosemite National Park's fire management program employs a variety of methods to accomplish and support fire and resource management objectives and to reduce the risk of wildfire in and adjacent to the park. Strategies in this plan are based on knowledge gained from fire and fuels research and monitoring, and from experience gained in Yosemite National Park over the last 50 years. Over the last 30 years, federal fire policy has changed from suppression of all wildfires to a policy allowing a single fire to be used as a tool to meet multiple land management and public safety objectives. After decades more than 30 years of proactive response to wildland fire, the park is far from restoring natural fire regimes to the entire park landscape, though significant inroads have been made. While fuel reduction and prescribed burning have increased since the 1990 A-Rock Fire, developed areas are still at risk from uncontrolled wildland fires. The 2001 Federal Fire Policy specifically mandates public land agencies to reduce the amount of forest and shrubland fuels around areas with homes and buildings, and to restore ecosystems to a more natural, fire-tolerant balance. In response, the National Park Service has issued new fire management guidelines that require updated fire management plans. Yosemite National Park's 2009 Operational Fire Management Plan serves to utilize the new fire management guidelines in outlining procedures for managing fire in Yosemite National Park; for restoration and maintenance of ecosystems, for reduction of hazard fuels, for protection of natural and cultural resources, and for protection of wildland urban interface communities.

The 2009 Operational Fire Management Plan builds on the 2004 Yosemite National Park Fire Management Plan/EIS.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Scenic Vista Management Plan**

Description: The Scenic Vista Management Plan is a comprehensive strategy to prioritize viewpoints for management, identify which methods of vegetation clearing area appropriate at what times and in which places, and describe what trees and brush may need to be removed to restore the view at high priority vistas. Proposed vista management methods could include fire, mechanical thinning, and trimming.

An environmental assessment was completed for this project and released for public review in winter 2010-2011. A finding of no significant impact was approved by the NPS Regional Director in August 2011. Project implementation will begin in 2012.

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Agency Name: National Park Service, Sequoia and Kings Canyon National Parks

Project Name: **Sierra Nevada Bighorn Sheep Environmental Assessment**

Description: The National Park Service, in cooperation with California Department of Fish and Game (CDFG), the US Geological Survey (USGS), and Inyo National Forest, is conducting a scientific study of Sierra Nevada Bighorn Sheep (*Ovis canadensis sierrae*), a federally endangered subspecies endemic to the parks. This study will provide scientific data needed to inform development of a new Wilderness Stewardship Plan (and environmental impact statement) for Sequoia and Kings Canyon National Parks and to implement key tasks of the Recovery Plan for Sierra Nevada Bighorn Sheep (USFWS 2007).

An environmental assessment was completed for this project and released for public review in June 2011. A finding of no significant impact was approved by the NPS Regional Director in August 2011. Project implementation is scheduled to begin in 2012.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tenaya Lake Area Plan**

Description: The purpose of this plan is to guide management of the Tenaya Lake Area. Because of its remarkable scenic qualities, its inviting blue water, and its proximity to Tioga Road, Tenaya Lake is one of the most popular destinations for summer visitors in Yosemite. Problems associated with visitor use, visitor safety, and resource impacts have been occurring for decades. The selected alternative includes ecological restoration of 9.7 acres within areas currently affected by visitor use, creation of volunteer trails, and stormwater erosion control. The trail systems around the lake and north of Tioga Road will be realigned to avoid sensitive natural and cultural resources and support protection and restoration, and pedestrian bridges and boardwalks over waterways and wetland habitat will be used to restore hydrological function of major waterways.

The Selected Alternative (Tenaya Confluence) includes the following modifications:

- Adjustments to and realignment of parking areas
- Creation of an accessible trail along the northern edge of the lake between East Beach and Murphy Creek and within the East Beach, Murphy Creek, and Sunrise Trailhead areas
- Removal and restoration of existing trails located within ecologically and culturally sensitive areas
- Removal of existing culverts and construction of a box culvert at the Tioga Road/Murphy Creek crossing, which will allow Murphy Creek to flow unimpeded under the roadway and into the lake
- Provision of interpretive materials and improved connections to the trail along the southern edge of the lake and Sunrise and Murphy Creek trailheads to facilitate wayfinding, minimize visitor confusion, and reduce the potential for volunteer trails and subsequent adverse effects to natural and cultural resources.

An environmental assessment was completed for this project and released for public review in 2010-2011. A finding of no significant impact was approved by the NPS Regional Director in April 2011. Project implementation began in summer 2011.

Agency Name: National Park Service, Yosemite National Park

Project Name: **Tioga Road Rehabilitation Project**

Description: The Tioga Road Rehabilitation project in Yosemite proposes analyzes rehabilitating approximately 41 miles of the Tioga Road. This road provides access to Tuolumne Meadows, Tioga Pass, U.S. Route 395 and numerous popular trailheads including: John Muir, Pacific Crest, Yosemite Creek, Lukens Lake, and others. The following goals guided development of alternatives for the proposed Tioga Road rehabilitation:

- Improve the safety of visitors and employees traveling on Tioga Road.
- Maintain the character of the road corridor, including significant cultural landscape characteristics such as the curvilinear alignment, grade, and road features including culverts, retaining walls, and turnouts.
- Restore drainage features to control erosion and to protect natural and cultural resources.
- Increase accessibility for park visitors and reduce confusion regarding designated roadside turnouts.
- Manage roadside parking and traffic flow through improved turnouts.
- Reduce rockfall potential along Tioga Road by scaling rock at select locations.
- Manage and improve the Tuolumne Grove parking area.

At Tuolumne Meadows, the *Tuolumne River Plan* will determine what specific actions will be taken along the road corridor. If a Record of Decision for the *Tuolumne River Plan* is not available when construction is ready to start, then this proposed project will solely address the resurfacing and repaving of the current road at Tuolumne Meadows.

An environmental assessment was completed for this project and released for public review in 2011.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tioga Road Corridor Campground Accessibility Improvements**

Description: This project will correct accessibility deficiencies at 20 campsites along the Tioga Road corridor as outlined in Yosemite National Park's Self Evaluation and Transition Plan. Sites to be improved include 12 Tuolumne Meadows sites, four Tamarack Flat sites, two White Wolf sites, one Yosemite Creek site, and one Porcupine Flat site. The exact 12 sites to be improved at Tuolumne Meadows Campground will be selected by a team of subject matter experts.

Preparation of environmental compliance documents was completed in 2010. Implementation began in 2011.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tioga Trailheads Project**

Description: The Tioga Pass Road provides access to many High Sierra trailheads. Some of the trailheads lack designated parking, requiring backcountry users to park their vehicles on roadsides. Dozens, sometimes hundreds, of vehicles can be parked alongside the road in this manner in July and August, leading to congestion and detracting from scenic views for other park users. This project addresses the site maintenance and design

elements that would improve visitor safety and experience, while also protecting natural and cultural resources, at eight formal trailheads: Gaylor Lakes at Tioga Pass, Mono Pass, Snow Creek, May Lake/Weston Pond, Porcupine, Yosemite Creek/Ten Lakes, Lukens Lake, and Tamarack Flat/Aspen Valley. Actions proposed vary according to the specific issues and concerns of each trailhead site. In general, categories and types of actions include the following:

- Site Delineation - curbing, split rail fencing, and adding boulders/logs to delineate parking areas.
- Way finding and Circulation - adding trailhead signs along roadways, adding trail signs, realigning or adding short trail segments, adding walkways.
- Visitor Safety - adding crosswalks to select trailhead areas, removing small vegetation or trees at ingress/egress to parking areas to improve sight lines.
- Visitor Experience - adding log rounds for seating at shuttle bus stop waiting areas, basic picnic facilities, adding or reinstalling some wayside interpretive exhibits, adding or expanding restroom facilities, providing appropriate parking capacity including overflow areas where needed, and adhering to the Americans with Disabilities Act regulations to promote visitor accessibility.
- Site Maintenance - repaving parking surfaces, replacing concrete curbing, trail reconstruction.
- Ecological Restoration - decompacting soils, revegetating, and allowing natural recovery where appropriate

Project planning and environmental compliance for this project were completed in 2010. Implementation began in 2011.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Meadows Upgrade Shuttle Stop Signs**

Description: The Tuolumne Meadows Shuttle bus stop signs along the Tioga Road from Olmstead Point to the Tioga Pass entrance station are being upgraded, as the signs are aged and have limited space for information. Signs are consistent with the Yosemite Valley Shuttle sign design. Signs will display a routing map, time schedule, and other information as deemed necessary.

Project planning and environmental compliance for this project were completed in 2010. Project implementation began in 2011.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Meadows Concessioner Stables Fence Modification**

Description: The San Francisco Public Utilities Commission (SFPUC) identified the drainage at the east side of the concessioner corrals at Tuolumne Meadows as an area of concern in 2009. Inspection indicated that the corrals are cleaned daily and there is no significant manure buildup within the corrals. However, potential water contamination by manure being washed downstream may occur during severe summer thunderstorms (defined as 2" or more of rainfall).

To address the SFPUC's concern, the National Park Service and the park concessioner will relocate the water trough from the eastern edge of the existing fenceline to the side of the barn so that the animals congregate in an area well away from the drainage/depression. The fenceline will be moved slightly to the west and a permeable retaining wall will be built along the east side of the corral to allow water during significant rain events to drain more gradually, permitting better percolation into the soils. The park archeologist has confirmed there are no archeological concerns with excavation in this already impacted corral area. The SFPUC has approved the concept. After the implementation, revegetation or landscape treatment will occur in the denuded area.

Project implementation was scheduled to begin in June 2011.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Meadows Water Treatment System Improvements**

Description: The water treatment system in the Tuolumne Meadows area requires periodic improvements and repairs. In the last few years the NPS has replaced the water line to Tuolumne Meadows Lodge in order to provide sufficient water pressure to the show house at the lodge. The project required a small amount of ground disturbance. Similar projects are expected to continue for the foreseeable future, some of them requiring ground disturbance.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Vegetation Management Plan**

Description: The Vegetation Management Plan is an addendum to the Yosemite National Park Resource Management Plan (RMP) (1993) and is guided by the 1980 General Management Plan. The purpose of the plan is to:

- Delineate the legislative and administrative requirements that guide development of vegetation management objectives;
- Refine the goals and objectives for vegetation management that are established in the RMP;
- Describe the dynamic environment of vegetation within the park and the social, cultural and natural processes that influence the vegetation;
- Discuss the current vegetation management issues, define management objectives, management techniques and strategies for achieving objectives, and information needed; and
- Provide a summary of vegetation management planning needs to be addressed in the future, including the roles and responsibilities for planning and implementation.

The framework of the plan provides guidance for specific implementation plans to be developed for vegetation management in Yosemite. Vegetation management projects are ongoing.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Wilderness Stewardship Plan**

Description: The National Park Service will be updating the 1989 Yosemite National Park Wilderness Management Plan. The objective of updating the plan is to provide guidance to park operations for the successful management of Yosemite's designated wilderness, which comprises over 95% of the park. The plan will address land management issues within the wilderness including visitor use, vegetation associations, air resources, noise issues, watershed, soils, cultural landscapes, and other natural, cultural, and social resource variables. The plan update will also address the use of the five High Sierra camps in Yosemite National Park. The development of the EIS is scheduled to begin in 2012 -2013.

### **Other Agencies**

Agency Name: U.S. Forest Service, all California national forests

Project Name: **National Forest Travel Management Plan and Forest Plan Revisions**

Description: The U.S. Forest Service will be developing Travel Management Plans and Forest Plans for all national forests in California over the next few years. Travel Management Plans specify what forms of travel are allowed in what areas of the national forests. Forest Plans guide where and under what conditions an activity or project on national forest lands can generally proceed. Some of the forests have completed one or both of these tasks

The environmental impact statement was completed in 2010 and the record of decision was available in late 2010.

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Agency Name: U.S. Forest Service, Sierra, Stanislaus, and Inyo National Forests

Project Name: **U.S. Forest Service Recreational Facility Analysis**

Description: In 2007, the U.S. Forest Service completed an analysis of its public recreation sites. The analysis examined existing demand for the recreational resources, the need to update or change the sites to meet the demand (including closing some sites that no longer have demand for them), and the agency's ability to make the recommended changes. The analysis concluded with a program of work to reduce the deferred maintenance on the sites by 20% in the ensuing five years. The work will include everything from improvements at some sites to closure of others.

The project is ongoing.

## Past Actions

### National Park Service

Agency Name: National Park Service, Yosemite National Park

Project Name: Fire Management Plan

Description: The purpose of this plan is to guide the implementation of a complex fire management program. The program includes wildland fire suppression, wildland fire used to achieve natural and cultural resource benefits, fire prevention, prescribed fire, fire ecology research, and the use of mechanical methods to reduce and thin vegetation in and around communities. The plan updated an existing 12-year-old fire management plan, and was called for by the National Fire Policy. The plan proposed alternatives for managing wildland and prescribed fire. The chosen alternative calls for the use of prescribed fire and passive reduction techniques in all areas to achieve protection, fuel reduction, and ecosystem restoration goals. More aggressive treatment strategies are to be used in developed areas if needed. Managed wildland fire (lightning-ignited fires) are to be allowed to burn where practicable, under specific conditions. The park is divided into two units, Fire Use and Suppression, which determine appropriate fire management treatments. Additionally, there are buffer zones around areas of Wildland/Urban Interface, which have specific fuel reduction techniques available depending on the distance from the Wildland/Urban Interface and whether it falls within congressionally designated Wilderness.

The Final Yosemite Fire Management Plan/Environmental Impact Statement was completed in 2004 and guides current park fire policy.

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Agency Name: National Park Service, Yosemite National Park

Project Name: Tuolumne Meadows Water Treatment Facility Regulatory Upgrade

Description: This project proposes to add a flocculation process to ensure adequate cryptosporidium removal compliance and meet the increased regulatory requirements. Adding an engineered 4,100 gallon pressure detention tank will allow proper time, flow baffling and particle collision for polymer reaction ensuring proper pathogen removal. The Department of Health services has approved this process addition.

The new tank is 10' long and 8' wide and would be located on the south side of the water treatment building in a currently disturbed area containing underground water piping. The slab or footings for the tank will be 8' x 10' or smaller, dependent upon seismic code requirements. No vegetation or trees will be removed in this process addition. This area is not visible to the public.

This project was completed in 2010.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Gaylor Pit Lead Abatement**

Description: During the construction of the new Tioga Road, Gaylor Pit was created as a borrow pit and quarry for road material. Since the 1950s the pit and surrounding area was used by the NPS for various administrative uses. In 1984, the California Wilderness Act designated 95% of Yosemite National Park as wilderness. Once the wilderness boundary near Gaylor Pit was validated, the entire Gaylor Pit area was decommissioned in 2003; ceasing such uses as storage, dumping, temporary native plant nursery, wood yard, staging, and shooting range.

In 2004, a three year project began to restore the area in both wilderness and non-wilderness to a more natural setting. Completed in 2006, the project proposed to restore the morphology and hydrology of the area, and to revegetate it in a manner that would reestablish wilderness character. Additionally, the project aimed to modify the slope edge of the helipad (which is in non-wilderness and still in use), fill the old barrow pit, and revegetate it to reduce erosion. The shooting range (0.15 acre), due to possible lead contamination, was not part of this effort.

The site contains approximately forty cubic yards of contaminated soil along with twenty logs used as a backstop for the range. Soil samples were collected from the range and surrounding area and analyzed for lead content in 2004. All samples except those from the backstop contained lead concentrations below 100 ppm. Samples from the backstop contained lead concentrations of 150-3600 ppm. The EPA's standard for lead in bare soil in playground areas is 400 ppm by weight and 1200 ppm for non-playground areas. This regulation applies to cleanup projects using federal funds. Measured lead solubility at the shooting range of 400 mg/l is 1,000 times higher than native lead solubility. The Dana Fork of the Tuolumne, which is federally protected as Wild and Scenic and also provides drinking water to the Tuolumne Meadows area, is 0.2 miles from the wooden backstop.

The goal of this project was to mitigate environmental lead contamination while protecting wilderness values at the abandoned Gaylor Pit shooting range. The objective of this project was to remove the wooden backstop, the litter of bullets and casings, and all soil contaminated with lead from bullets and casings. After removal, the area was restored to its wilderness appearance.

This project was completed in 2006.

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Agency Name: Delaware North Companies Parks and Resorts at Yosemite

Project Name: **Restoration of Disturbed Areas at Tuolumne Meadows Lodge**

Description: The park's primary concessioner, Delaware North Companies Parks and Resorts, performed restoration work at Tuolumne Meadows Lodge in 2008 and 2009. The restoration work included soil decompaction, trail delineation, planting of indigenous vegetation, correcting site drainage and improving the existing service road through camp.

This project was completed in 2009.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Service Station Soil Gas Survey**

Description: The purpose of the soil gas survey at the Tuolumne Meadows Service Station (TMSS) was to characterize the presence or lack of Volatile Organic Compounds (VOC) within the shallow soil zone to support underground clean-up activities related to the 1998 removal and replacement of underground fuel tanks. The Regional Water Quality Control Board was interested in this characterization because remediation at the site was nearing conclusion and the agency requires this type of data at sites such as this before they will grant official closure.

This project was completed in 2008.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Meadows Service Station Vapor Recovery Installation**

Description: The purpose of this project was to comply with California air quality environmental regulations for fuel dispensing systems at the Tuolumne Meadows Service Station. California Air Resources Management set April 30, 2009 as the final date to convert to a new vapor recovery system in order to improve California air quality. The existing dual-hose fuel dispenser units were removed and replaced with the approved single-hose dispenser having the Healy Vapor Recovery System. Concrete islands and pads were be demolished and replaced with new double contained dispenser pans, piping, and an upgraded electronic monitoring system. Excavation occurred in existing trench lines and pre-disturbed areas from a 1998 project to upgrade the underground tank systems at the Tuolumne Service Station.

This project was completed in 2008.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Meadows Water Line Replacement**

Description: The purpose of this project was to restore sufficient water pressure at the Tuolumne Meadows Lodge (TML) shower house. The project involved "hot tapping" a new water valve into the 4" water main that services Tuolumne Meadows. Park utility staff performed the valve installation in the existing Tuolumne utility corridor. The work involved excavating approximately 30" deep to the main water line, installing the valve and backfilling with the excavated materials. In addition, a 250' above ground temporary water line was installed from the new valve to the TML shower house for water service at the showerhouse/restroom. The temporary line was replaced with a permanent solution in 2008.

This project was completed in 2008.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Tuolumne Winter Ranger Residence Install Alternative Power Sources**

Description: Numerous power outages occur in Tuolumne Meadows due to winter storm cycles. Southern California Edison also preemptively cuts off power when wind is predicted, and they have indicated that they will not fix power lines which come down in Lee Vining Canyon in the winter. Winter rangers are necessary at Tuolumne Meadows to prevent resource damage and give information for winter backcountry users. They also shovel roofs and prevent damage to structures from snow loading in addition to collecting snow survey data monthly.

Therefore, an alternative power system was installed to support winter rangers and convert the ranger residence to a power system independent of the electrical grid. This system involved installation of solar panels on the south facing roof of the ranger residence, and installation of a propane tank to fuel a propane generator to augment the solar power.

This project was completed in 2007.

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Agency Name: National Park Service, Yosemite National Park

Project Name: **Pate Valley and Yosemite Valley Invasive Velvet Grass Control**

Description: Highly-invasive non-native velvet grass (*Holcus lanatus*) is a new serious threat to intact mid-elevation riparian, meadow, and fen communities in Yosemite. It has not reached the point of no return in Yosemite, but if left unchecked, velvet grass will continue its spread throughout moist or disturbed areas throughout mid-elevations in the park. This project proposed to control velvet grass in three top-priority sites—the fen at Happy Isles, Mirror Lake, and Pate Valley (located in the Tuolumne Wild and Scenic River corridor, below the Grand Canyon of the Tuolumne). The goal of the project was to reduce velvet grass at these sites to a maintenance level, and to gather information and make informed decisions on the best management of velvet grass in the future.

This project was implemented in 2006.

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## **Other Agencies**

Agency Name: U.S. Forest Service, all national forests in the Yosemite area.

Project Name: **Grazing Allotment Permit Renewals**

Description: When grazing allotments on the national forests are close to expiration, the agency examines the environmental impacts of continued grazing allotment by allotment. Based on this examination, the agency will then adjust allotments as needed. For example, the Inyo National Forest closed an area to continued cattle grazing to protect bighorn sheep populations. Another management change the agency may require is for the permit holder to construct fencing along creeks or around riparian areas to protect these sensitive areas from trampling by cattle.

The Inyo National Forest Mono Basin Grazing Allotments Environmental Assessment (EA) was available for comment in October 2010. The proposed action would authorize continued livestock grazing on the Dexter Creek, June Lake, and Mono Mills sheep and goat allotments, along with the Mono Sand Flat cattle and horse allotment. The proposed action is designed to maintain or improve trends in vegetation, watershed conditions, and ecological sustainability relative to livestock grazing by incorporating adaptive management strategies on the allotments. The decision document was signed in 2011.

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Agency Name: San Francisco Public Utilities Commission

Project Name: **O'Shaughnessy Diversion Tunnel Flap Gate Clearing Project**

Description: In 2006, the San Francisco Public Utilities Commission restored the Tuolumne River streambed within 200 feet downstream and 200 feet upstream of the O'Shaughnessy Diversion Tunnel. The commission removed about 5,000 cubic yards of material (gravel, cobbles, and boulders) from the channel, disposing of it on nearby lands within Yosemite National Park granted to the commission under the Raker Act. This project was completed in 2006.

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Agency Name: San Francisco Public Utilities Commission

Project Name: **Upper Tuolumne River Ecosystem Project - O'Shaughnessy Dam Instream Flow Evaluation Study Plan**

Description: The SFPUC initiated the Upper Tuolumne River Ecosystem Project with the goal of conducting a set of long-term, collaborative, science-based investigations designed to (1) characterize historical and current river ecosystem conditions, (2) assess their relationship to Hetch Hetchy Project operations, and (3) provide recommendations for improving ecosystem conditions on a long-term, adaptively managed basis. The Ecosystem Project will provide data and analyses to (1) support implementation of the Water Enterprise Environmental Stewardship Policy on the Upper Tuolumne River, (2) support ongoing Yosemite National Park Tuolumne Wild and Scenic River planning and management efforts, (3) provide the scientific basis for resolving outstanding issues with the U.S. Department of the Interior related to the 1987 Stipulation under the Raker Act, and (4) implement mitigation and monitoring requirements specified in the Final Programmatic Environmental Impact Report for the Water System Improvement Program (WSIP PEIR). Primary partners include the SFPUC, Yosemite National Park, Stanislaus National Forest, and the U.S. Fish and Wildlife Service.

This plan was published in 2009.

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Agency Name: San Francisco Public Utilities Commission

Project Name: **Water System Improvement Program**

Description: The San Francisco Public Utilities Commission (SFPUC) approved its Water System Improvement Program (WSIP) in 2008, which caps diversions from the Tuolumne River at Hetch Hetchy to 265 million gallons per day through 2018. SFPUC and its wholesale customers in the San Francisco Bay Area will be

required to meet additional demands by conservation and recycling; however such measures would be limited to a 20% reduction in water service system wide during extended droughts. While withdrawals at Hetch Hetchy have been capped at current levels until 2018, additional withdrawals resulting from extended drought conditions could affect downstream flows at Poopenaut Valley.

This program was approved in 2008.

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# Appendix N:

## Mitigation Measures Applicable to all Action Alternatives

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts. To help ensure that field activities associated with the *Tuolumne River Plan* protect natural, cultural, and social resources and the quality of the visitor experience, mitigation measures have been developed. The following section discusses mitigation measures that would occur prior to, during, and after construction of the proposed improvements.

Mitigation Measure	Responsibility	Critical Milestones
<b>CONSTRUCTION MITIGATION MEASURES</b>		
Prior to entry into the park, steam-clean heavy equipment to prevent importation of non-native plant species, tighten hydraulic fittings, ensure hydraulic hoses are in good condition and replace if damaged, and repair all petroleum leaks.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Inspect the project to ensure that impacts stay within the parameters of the project area and do not escalate beyond the scope of the environmental impact statement, as well as to ensure that the project conforms with all applicable permits or project conditions. Store all construction equipment within the delineated work limits.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Implement compliance monitoring to ensure that the project remains within the parameters of National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance documents.	Yosemite National Park, Project Manager; Contractor	Concurrent with project activities
Provide a project orientation for all construction workers to increase their understanding and sensitivity to the challenges of the special environment in which they will be working.	Yosemite National Park, Project Manager	Prior to and concurrent with project activities
If deemed necessary, demolition/construction work on weekends or federal government holidays may be authorized, with prior written approval of the Superintendent.	Yosemite National Park, Project Manager	Prior to and concurrent with project activities
Remove all tools, equipment, barricades, signs, surplus materials, and rubbish from the project work limits upon project completion. Remove all debris from the project site.	Yosemite National Park, Project Manager; Contractor	Upon completion of project activities
The Construction Contractor shall prepare a Health and Safety Plan to address all aspects of Contractor health and safety issues compliant with OSHA standards and other relevant regulations. The Plan shall be submitted for park review and approval prior to construction.	Contractor	Prior to and concurrent with project activities
A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the Construction Contractor and implemented for construction activities to control surface run-off, reduce erosion, and prevent sedimentation from entering water bodies during construction. The SWPPP shall be submitted for park review and approval prior to construction. The plan will include measures such as: <ul style="list-style-type: none"> <li>▪ Take measures to control erosion, sedimentation, and compaction, and thereby reduce water pollution and adverse water quality effects. Use silt fences, sedimentation basins, etc. in construction areas to reduce erosion, surface scouring, and discharge to water bodies.</li> <li>▪ To the extent possible, schedule the use of mechanical equipment during periods of low precipitation to reduce risk of accidental hydrocarbon leaks or spills. When mechanical equipment is necessary outside of low precipitation periods, use NPS-approved methods to protect soil and water from contaminants.</li> <li>▪ Dispose of volatile wastes and oils in approved containers for removal from construction sites to avoid contamination of soils, and drainages. Inspect equipment for hydraulic and oil leaks prior to use on construction sites, and implement inspection schedules to prevent contamination of soil and water. Keep absorbent pads, booms, and other materials on site during projects that use heavy equipment to contain oil, hydraulic fluid, solvents, and hazardous material spills.</li> </ul>	Contractor	Prior to and concurrent with project activities

Mitigation Measure	Responsibility	Critical Milestones
<b>CONSTRUCTION MITIGATION MEASURES (CONTINUED)</b>		
Develop and implement a comprehensive Spill Prevention/Response Plan that complies with federal and state regulations and addresses all aspects of spill prevention, notification, emergency spill response strategies for spills occurring on land and water, reporting requirements, monitoring requirements, personnel responsibilities, response equipment type and location, and drills and training requirements. The spill prevention/response plan will be submitted to the park for review/approval prior to commencement of construction activities.	Contractor	Prior to project activities
A construction work schedule shall be prepared by the Construction Contractor for the project that minimizes effects on wildlife in adjacent habitats and peaks in visitation. The work schedule shall be submitted for park review and approval prior to construction.	Contractor	Prior to and concurrent with project activities
Supervisory construction personnel shall attend an Environmental Protection briefing provided by the park prior to working on site. This briefing is designed to familiarize workers with statutory and contractual environmental requirements and the recognition of and protection measures for archeological sites, sensitive habitats, water resources, and wildlife habitats.	Contractor	Prior to and concurrent with project activities
The park shall develop a Communications Strategy Plan to alert necessary park and concessioner employees, residents and visitors to pertinent elements of the construction work schedule.	Yosemite National Park, Project Manager	Prior to and concurrent with project activities
Identify locations of existing utilities prior to removal activity to prevent damage to utilities. The NPS maintenance staff will be informed 10 working days prior to any ground disturbance. The Underground Services Alert will be informed 72 hours prior to any ground disturbance. Construction-related activities will not proceed until the process of locating existing utilities is completed (water, wastewater, electric, communications, and telephone lines).  An emergency response plan will be required of the contractor.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Promptly reconnect utility services that are interrupted because of construction activities and provide advance notification if utility service will be disrupted.	Yosemite National Park, Project Manager; Contractor	Concurrent with and following project activities
Provide proper and timely maintenance for vehicles and equipment used during construction to reduce the potential for mechanical breakdowns.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
<b>HYDROLOGY AND WATER QUALITY</b>		
Where working areas are adjacent to or encroach on live streams, construct barriers that are adequate to prevent the discharge of turbid water in excess of specified limits.	Contractor	Prior to and concurrent with project activities
Stabilize all disturbed soil and fill slopes in an appropriate manner.	Contractor	Prior to and concurrent with project activities
Store equipment and materials away from all waterways.	Yosemite National Park, Project Manager; Contractor	Concurrent with project activities
Construction limits in the vicinity of wetlands should be clearly delineated with construction fencing	Contractor	Prior to and concurrent with construction activities
Waters shall be free of changes in turbidity that cause a nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits, as described in <i>The Water Quality Control Plan</i> for the Central Valley Regional Water Quality Control Board (CVRWQCB 1998). In determining compliance with the limits below, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected <ul style="list-style-type: none"> <li>▪ Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.</li> <li>▪ Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.</li> <li>▪ Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.</li> <li>▪ Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.</li> </ul>	Contractor	Prior to and concurrent with project activities

Mitigation Measure	Responsibility	Critical Milestones
<b>HYDROLOGY AND WATER QUALITY (CONTINUED)</b>		
Wastewater contaminated with silt, grout, or other by-products from construction activities shall be contained in a holding or settling tank to prevent contaminated material from entering watercourses.	Contractor	Concurrent with project activities
Remove hazardous waste materials generated during implementation of the project from the project site immediately.	Contractor	Concurrent with project activities
Dispose of volatile wastes and oils in approved containers for removal from the project site to avoid contamination of soils, drainages, and watercourses. Keep absorbent pads, booms, and other materials onsite during projects that use heavy equipment to contain oil, hydraulic fluid, solvents, and hazardous materials spills.	Contractor	Concurrent with project activities
Use silt fencing at drainages to prevent construction materials from escaping work areas.	Contractor	Concurrent with project activities
Incorporate trench plugs into new and abandoned utility corridors through meadow and wetland areas to prevent formation or continuation of groundwater conduits.	Yosemite National Park; Project Manager; Contractor	Concurrent with project activities
Design surface drainage facilities to transport runoff in a non-erosive manner.	Yosemite National Park; Project Manager; Contractor	Prior to and concurrent with project activities
Structure or fill must be properly maintained so as to avoid adverse impacts on aquatic environments or public safety.	Yosemite National Park, Project Manager; Contractor	Prior to, concurrent with and following project activities
Collect and cover material from construction work, and avoid depositing it where it could be eroded and carried to tributaries or the river by surface runoff or high stream flows.	Contractor	Concurrent with project activities
Minimize disturbance area at the banks of drainages. Salvage excavated materials for replacement after construction. The banks of drainages will be restored to their pre-existing contours.	Contractor	Concurrent with project activities
At utility corridors, provide adequate drainage to prevent surface water or subsurface seepage from saturating the subgrade utility corridor.	Contractor	Concurrent with project activities
<b>VEGETATION AND WETLANDS (INCLUDING SPECIAL STATUS PLANTS)</b>		
Measures will be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering the waterway or wetlands (see Construction, above). All actions will be consistent with state water quality standards and Clean Water Act Section 401 certification requirements.	Yosemite National Park, Project Manager; Contractor	Prior to project activities
Heavy equipment use in wetlands must be avoided if at all possible. Heavy equipment used in wetlands must be placed on mats, or other measures must be taken to minimize soil and plant root disturbance and to preserve preconstruction elevations	Yosemite National Park, Project Manager; Contractor	Prior to concurrent with project activities
Whenever possible, excavated material must be placed on an upland site. However, when this is not feasible, temporary stockpiling of excavated material in wetlands must be placed on filter cloth, mats, or some other semi-permeable surface, or comparable measures must be taken to ensure that underlying wetland habitat is protected. The material must be stabilized with straw bales, filter cloth, or other appropriate means to prevent reentry into the waterway or wetland	Yosemite National Park, Project Manager; Contractor	Concurrent with project activities
Temporary stockpiles in wetlands must be removed in their entirety as soon as practicable. Wetland areas temporarily disturbed by stockpiling or other activities during construction must be returned to their pre-existing elevations, and soil, hydrology, and native vegetation communities must be restored as soon as practicable.	Yosemite National Park, Project Manager; Contractor	Concurrent with project activities

Mitigation Measure	Responsibility	Critical Milestones
<b>VEGETATION AND WETLANDS (INCLUDING SPECIAL STATUS PLANTS), CONTINUED</b>		
A Park Botanist will oversee placement of construction fencing to avoid impacts to sensitive plants and wetlands.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Preconstruction surveys will be conducted to identify special status species within the construction disturbance zone. If special-status plant species are identified within the construction disturbance zone, the project manager will work with the Park Botanist to avoid impacts.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Wetlands have been delineated and will be clearly marked prior to work. Perform activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Minimizing shade impacts, to the extent practicable, should be a consideration in designing boardwalks and similar structures.	Yosemite National Park, Project Manager; Contractor	Prior to concurrent with project activities
Ensure that all earth moving equipment and hand tools enter the park free of mud or seed-bearing material to prevent the introduction of non-native plants. The NPS will inspect all equipment prior to use on the project.  Map and treat noxious weeds prior to construction. Certify all seeds and straw material as weed-free. Ensure that imported top-soil is weed-free. The NPS will approve sources of imported fill material that will be used within the top 12 inches of the finished grade. Monitor and treat invasive plants for three years post-construction.	Yosemite National Park, Project Manager; Contractor	Prior to, concurrent with and following project activities
Install temporary fencing (black silt fencing or orange construction fencing) around the entire project area to protect natural surroundings (including trees, and root zones) from damage. Avoid fastening ropes, cables, or fences to trees.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities
Use native seed mix or seed-free mulch to minimize surface erosion and the introduction of noxious weeds.	Contractor	Concurrent with project activities
Contractor will develop a Revegetation Plan in conjunction with the park's Resources Management and Science Division, to be approved prior to construction activities.	Yosemite National Park, Project Manager; Contractor	Prior to project activities
Revegetation of disturbed soil areas should be facilitated by salvaging and storing existing topsoil and reusing it in restoration efforts in accordance with NPS policies and guidance. Topsoil storage must be for as short a time as possible to prevent loss of seed and root viability, loss of organic matter, and degradation of the soil microbial community.	Contractor	Concurrent with project activities
Where actions could impact wetlands, wetland restoration proposals must, at a minimum, provide one-for-one (1:1) wetland function replacement (i.e., no net loss of wetland functions).	Yosemite National Park	Prior to project activities
<b>WILDLIFE (INCLUDING SPECIAL STATUS WILDLIFE)</b>		
General: Provide information to the contractor regarding protection of special status species wildlife at the project briefings and provide contractor specifications and Best Management Practices to avoid activities that are destructive to wildlife and habitats.  Project Manager will consult with the park biologist to schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods.  Construction personnel will adhere to park regulations concerning food storage and refuse management. All food will be properly stored during the work day and will be removed from the site at the end of each work day.	Yosemite National Park, Project Manager; Contractor	Concurrent with and following project activities
For owls:  Limit the effects of light and noise on adjacent habitat. No outdoor construction activities are to occur between dusk and dawn, to eliminate the need for outdoor construction lighting, and to avoid disruption of mating, nesting, or foraging owls.	Yosemite National Park, Project Manager; Contractor	Prior to and concurrent with project activities

Mitigation Measure	Responsibility	Critical Milestones
<b>WILDLIFE (INCLUDING SPECIAL STATUS WILDLIFE), CONTINUED</b>		
<p>For birds:</p> <p>A wildlife biologist will conduct bird surveys and review current owl reports to determine whether special status species are present and may be mating, nesting, or foraging in the project vicinity.</p> <p>If trees are to be trimmed or removed, the biologist will first survey (within 4 days prior to any such work) to determine whether there are any nests present, and advise as to whether the activity must be delayed to ensure that sensitive species such as nesting migratory birds are protected and not disrupted.</p> <p>If nesting birds are observed (during bird surveys, or discovered by workers) that are not special-status species, the project manager will notify the park wildlife biologist who will recommend steps to avoid undesirable impacts to the nest or young.</p>	Yosemite National Park, Project Manager working with the park wildlife biologist	Prior to construction
<p>For bats:</p> <p>A park biologist will conduct bat surveys in the vicinity (for maternity colonies) and in fall (for potentially roosting/hibernating bats), and will provide specific directions for avoiding their disturbance if they are found. If bats are detected, the specific area will be protected and work on that particular area will be delayed until the bats vacate or can be excluded from the area in a manner that does not adversely affect their survival or that of their young.</p> <p>If surveys conducted immediately prior to construction do not reveal any bat species present within the project area, then the action will begin within three days to prevent the destruction of any bats that could move into the area after the survey.</p>	Yosemite National Park, Project Manager, Contractor	Prior to and concurrent with project activities
<p>For mountain beaver, Yosemite toads, and Sierra Nevada yellow-legged frogs:</p> <p>The contractor will adhere to 401/404 permits to prevent increased turbidity in the creek from occurring during construction activities.</p> <p>Water output design will dissipate water slowly, and avoid concentrated outflows to the meadow or tributaries.</p> <p>Continuous water flows and water quality will be maintained for tributaries of the wild and scenic river. Only minimal and temporary holding or diversion of water for immediate and specific construction work will be allowed. If water is retained during construction, the containment will include wildlife escape ramps and the containment will be inspected in the morning before beginning work and at the end of the day to ensure that no animals have become trapped.</p> <p>Suitable habitat for Yosemite toads and Sierra Nevada yellow-legged frogs exists in Tuolumne Meadows. A biologist will survey for these species prior to construction. If adults, tadpoles, or eggs are discovered, the biologist will inform the Project Manager how best to avoid harm during construction activities, and may recommend delaying/rescheduling work in that particular section or minimizing the diversion of water.</p>	Yosemite National Park, Project Manager	Prior to and concurrent with project activities
<b>FEDERAL AND STATE PERMIT REQUIREMENTS</b>		
The NPS will apply for and comply with all federal and state permits required for construction-related activities, including the California Regional Water Quality Control Board and the U.S. Army Corps of Engineers.	Yosemite National Park, Project Manager	Prior to project activities
<b>AMERICAN INDIAN TRADITIONAL CULTURAL RESOURCES AND PRACTICES</b>		
Culturally associated tribes will be given notice prior to ground disturbing activities at the project site and may be present at the project site to monitor ground disturbance during construction.	Yosemite National Park, Project Manager, Contractor	Prior to and concurrent with project activities
The NPS would continue to consult with culturally associated American Indian tribes and groups throughout the project to avoid or mitigate damage to American Indian traditional resources.	Yosemite National Park, Project Manager	Prior to, concurrent with and following project activities

Mitigation Measure	Responsibility	Critical Milestones
<b>HISTORIC PROPERTIES</b>		
The Park will adhere to the <i>Park Programmatic Agreement Among the National Park Service at Yosemite, the California State Historical Preservation Officer, and the Advisory Council on Historic Preservation Regarding Planning, Design, Construction, Operations, and Maintenance, Yosemite National Park, California (1999 PA)</i> to resolve adverse effects. Standard mitigation measures, as defined in the 1999 PA, include photo documentation, salvage, and reevaluation of National Register status	Yosemite National Park, Project Manager	Prior to and concurrent with project activities
All treatments within historic landscapes will be in keeping with the <i>Secretary of The Interior's Standards for the Treatment of Historic Properties</i> .	Yosemite National Park, Project Manager	Prior to project activities
Design all new construction within historic districts and landscapes or adjacent to historic sites to be compatible in terms of architectural elements, scale, massing, materials, and orientation.	Yosemite National Park, Project Manager	Prior to project activities
Archeological sites will be fenced off with orange hazard fencing by a professional archeologist. All project personnel would be briefed to stay out of areas with sensitive archeological resources.	Yosemite National Park, Project Manager, Contractor	Prior to project activities
The possibility of inadvertent discovery of archeological resources would be addressed through monitoring and discovery stipulations as defined in the 1999 PA.	Yosemite National Park, Project Manager, Contractor	Prior to and concurrent with project activities
<b>DUST ABATEMENT MEASURES</b>		
Cover and/or seal truck beds and stockpiles to minimize blowing dust or loss of debris.	Contractor	Concurrent to project activities
Limit truck and related construction equipment speeds in active construction areas to a maximum of 15 miles per hour and strictly adhering to park regulations and posted speed limits in other areas while inside park boundaries.	Contractor	Concurrent to project activities
Maintain adequate dust suppression equipment and use clean water to control excess airborne particulates at staging areas, active construction zones, and unpaved roads leading to/from active construction areas.	Contractor	Concurrent with project activities
<b>EMERGENCY NOTIFICATION MEASURES</b>		
Develop an emergency notification plan that complies with park, federal, and state requirements and allows contractors to properly notify park, federal, and/or state personnel in the event of an emergency during construction activities. This plan will address notification requirements related to fire, personnel, and/or visitor injury, releases of spilled material, evacuation processes, etc. The emergency notification plan will be submitted to the park for review/approval prior to commencement of construction activities.	Yosemite National Park, Project Manager	Prior to project activities
<b>HAZARDOUS MATERIALS MEASURES</b>		
An Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan shall be prepared by the Construction Contractor for the project to address hazardous materials storage, spill prevention and response. The Plan shall be submitted for park review and approval prior to construction.	Contractor	Prior to and concurrent with project activities
Store and use all hazardous materials in compliance with federal regulations. All applicable Materials Safety Data Sheets will be kept on site for inspection.	Contractor	Concurrent with project activities
<b>HAZARDOUS MATERIALS MEASURES (CONTINUED)</b>		
Hazardous or flammable chemicals shall be prohibited from storage in staging areas, except for those substances identified in the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan. Hazardous waste materials shall be immediately removed from project site in approved containers.	Contractor	Concurrent with project activities
Comply with all applicable regulations and policies during the removal and remediation of asbestos, lead paint, and polychlorinated biphenyls, as applicable.	Contractor	Concurrent with project activities
<b>SOUNDSCAPES</b>		
Ensure that all construction equipment has functional exhaust/muffler systems.	Contractor	Concurrent with project activities
Submit a construction work plan/schedule that minimizes construction-related noise in noise-sensitive areas to the park for review/approval prior to commencement of construction activities.	Contractor	Prior to project activities

<b>Mitigation Measure</b>	<b>Responsibility</b>	<b>Critical Milestones</b>
<b>SOUNDSCAPES, CONTINUED</b>		
Use hydraulically or electrically powered construction equipment, when feasible.	Contractor	Concurrent with project activities
Locate stationary noise sources as far from sensitive receptors as possible.	Contractor	Concurrent with project activities
Limit the idling of motors except as necessary (e.g., concrete mixing trucks).	Contractor	Concurrent with project activities
To the extent possible, perform all on-site noisy work above 76 A-weighted decibels (dBA) (such as the operation of heavy equipment) between the hours of 8:30 a.m. and 5:00 p.m. to minimize disruption to nearby park users.	Contractor	Concurrent with project activities
<b>SCENIC RESOURCES PROTECTION MEASURES</b>		
Fence construction staging areas and construction activity areas to visually screen construction activity and materials.	Contractor	Concurrent with project activities
Consolidate construction equipment and materials to the staging areas at the end of each work day to limit the visual intrusion of construction equipment during nonwork hours.	Contractor	Concurrent with project activities
Conduct contrast analysis for any proposed structures	Yosemite National Park	In the design and proposal phase
<b>TRAFFIC CONTROL AND VISITOR PROTECTION MEASURES</b>		
Provide protective fencing enclosures around construction areas, including utility trenches, to protect public health and safety.	Contractor	Concurrent with project activities
<b>WASTE MANAGEMENT MEASURES</b>		
Require construction personnel to adhere to park regulations concerning food storage and refuse management.	Yosemite National Park, Project Manager; Contractor	Concurrent with project activities
Properly secure trash during the workday and remove all trash from site at the end of each workday.	Yosemite National Park, Project Manager	Concurrent with and following project activities

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# Appendix O: The Process Used to Develop the Alternatives

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## The Tuolumne River Planning Framework

The National Environmental Policy Act (NEPA) requires federal agencies to rigorously explore a range of reasonable alternatives when planning for a major federal action. NEPA also mandates an early and open process to determine the scope of issues surrounding the proposed action, to develop options for addressing those issues, and to provide for public review and comment on the environmental analyses presented in the project's Draft Environmental Impact Statement (Draft EIS).

Using a full complement of park personnel, including experts in park operations, facilities, and cultural and natural resources, the Tuolumne River planning team (planning team) devoted several years of effort, from 2005 to 2012, to develop four action alternatives for managing the river corridor. In building the alternatives, the team worked within a planning framework that included eight major steps, which are explained below. Although this framework is described as a series of sequential activities, planning is fundamentally iterative. At each step, new information is uncovered and new insight is gained that can trigger changes to prior decisions. In the case of the Tuolumne, some of these steps were revisited almost yearly. Although time-consuming, this process of review and revision ultimately lead to a stronger end product, both in form and content.

The National Park Service (NPS) began the Tuolumne Wild and Scenic River Comprehensive Management Plan (*Tuolumne River Plan*) process in 2005, following the release of the *Revised Merced River Plan* (2005). The NPS had initiated the park's first comprehensive river management planning process for the Merced Wild and Scenic River corridor with the *Merced River Plan* (2000) and *Revised Merced River Plan* (2005). An outstanding lawsuit against the NPS in response to these plans was settled, and a legally binding settlement agreement was executed between National Park Service and former plaintiffs, in September 2009. The Settlement Agreement, and its preceding court decisions, provided direction on wild and scenic river planning not only for Yosemite and the NPS, but for all agencies managing wild and scenic rivers—direction that caused NPS to revise the alternatives development process.

Additionally, extensive internal review and public input affected the process, occasioning still more revisions to it. Additional steps were added while some other earlier steps were eventually found to be unnecessary (such as management zoning in the Tuolumne River corridor). In the end, the key steps taken to develop the *Tuolumne River Plan* alternatives mirrored those for the *Merced River Plan* (slated for public review in fall 2012), with the steps below revisited several times in both plans. As noted previously, however, it was not so much the order of the steps to be followed that was critical so much as it is that all steps be taken, with revisions to other steps taken as needed—so long as protection and enhancement of river values always be ensured. Each of the Tuolumne River Plan alternatives accomplishes this requirement.

The following sections describe the objectives for each step in the Tuolumne River planning process and NPS actions to meet those objectives.

## **Step 1. Define River Values to be Protected and Enhanced**

The Wild and Scenic Rivers Act (WSRA) mandates that each wild and scenic river “. . .shall be administered in such manner as to protect and enhance the values which caused it to be included in said system” (WSRA, Section 10 (a)). The values to be protected include the river’s free-flowing condition, water quality, and those values that are “outstandingly remarkable.” The Interagency Wild and Scenic Rivers Coordinating Council (Interagency Council) criteria for outstandingly remarkable values (ORV) state that the value must be river related and rare, unique, or exemplary in a regional or national context.

The NPS began the process of identifying the ORVs for the Tuolumne River in 2005. After completing other steps in the alternative development process (below), park planners revisited the ORVs several times (every year since 2005). Each time, park planners revised and updated the list, with further definitional clarification from the Interagency Council.

The planning team conducted internal ORV workshops using available research and monitoring information, subject-matter expertise, peer review, government partners, management input, and expert guidance from other wild and scenic river professionals. As detailed on Table 9-2, park planners also accepted public comment and comments from culturally associated tribes and groups on the ORVs numerous times between 2005 and 2010. The ORVs are listed in chapter 5, and their evolution over time is detailed in appendix F.

Because river values are a foundational element of the plan, they remain constant across all alternatives.

## **Step 2. Assess Baseline Condition of River Values**

Once river values have been identified, it is critical to assess their condition, so that any problems can be remedied in the plan (if possible). Park planners assessed the condition of the Tuolumne River ORVs beginning in 2006. Information used to evaluate the baseline condition of the Tuolumne River ORVs included research studies and models of natural systems developed specifically for this planning effort; historic photos, maps, and archival materials; and the professional judgment of subject matter experts with extensive experience in their field. Park managers sought external peer reviews of specific research findings and the conclusions for overall river conditions where appropriate. The public also identified potential areas of concern related to the ORVs, during project scoping and in later public outreach efforts (see again chapter 9).

The planning team consolidated all of this information into the *Tuolumne River Values and Baseline Conditions*, which was released to the public in spring 2011. The assessment was also incorporated into chapter 5 of the *Tuolumne River Plan/Draft EIS*. To the extent information was available, the report contains an assessment of river values at the time of designation (1984) and today. This important step in the planning process provides a baseline for comparison with the expected outcome of the actions described in the management alternatives. It was also essential for identifying areas where immediate action must be taken to improve conditions in the river corridor.

Although the baseline conditions assessment report was not completed until 2011, the evaluation of baseline conditions began in 2005 and preliminary results were shared with the public as early as 2006, with associated

opportunities for public input. Park planners were aware of river value conditions early in the planning process and structured and revised the alternatives to address management concerns currently found in the report.

### **Step 3. Define Desired Condition, Adverse Impact and Degradation for River Values**

In concert with assessing river values, park managers determined what the desired condition should be for those values, based on guiding legislation, available research and monitoring information, best professional judgment of subject matter experts, and current trends in the relevant academic and public land management fields. Further, a comprehensive river management plan must contain provisions designed to prevent any adverse impacts or degradation from occurring to the river values. Specific thresholds must be stated for mandatory management action that will occur ahead of any such impacts or degradation, to keep river value conditions at or above the desired condition state.

For each river value, desired conditions are called *Management Standards*, as discussed in chapter 5. NPS subject matter experts determined management standards attainable under current trends, given the most up-to-date understandings from their respective fields and implementation of all the actions discussed in this draft EIS. The management standard is an aspirational state, the condition to which park managers aspire to bring the value if its condition is diminished (step 4 in the process applies these definitions to the assessment of conditions detailed in step 2). If a river value is within its management standard, it is considered to be both protected and enhanced.

If a river value exhibits conditions that do not meet the management standard, it may be suffering adverse impacts, degradation, or management concerns. The severity of such declines in river condition may vary, so it is critical to develop benchmarks of river condition that quantify the deterioration (which can help to guide restoration efforts; see step 4 below). *Adverse impacts* are defined to be a substantial reduction in the condition of a river value in relation to baseline conditions as a result of public use, development, and/or administrative use. An adverse impact is a segment-wide effect and requires immediate attention by the agency. *Degradation* is worse; it is defined as the state in which a river value has been fundamentally altered by public use or development to the point that its value is lost for at least a decade. Degradation is a long-term, segment-wide condition. A river value has been degraded when recovery would only be possible through a sustained change in park management and a significant investment of financial and natural capital. Other reductions in river value condition may not be as severe as adverse impact or degradation, yet may still drop river value condition down to a point at which management action is warranted (the trigger points identified in chapter 5). Such reductions in river value are considered *management concerns*. For all river values, it is essential to quantitatively define these terms to the extent possible, so that future protection and enhancement of their conditions can be assured.

Along with these terms, park managers also developed indicators of river value condition that are sensitive to change, along with monitoring protocols. Such indicators and protocols are intended to accurately reflect river value condition and are easily repeatable. By following such protocols, park managers will have early warnings should any river value condition begin to exhibit a downward trend. In some cases, a river value may not lend itself easily to monitoring, such as stairstep river morphology, which is affected only by massive geologic forces well outside of human control. Consequently, park managers did not define these terms for that river value. Most river values, though, had indicators developed.

For the Tuolumne wild and scenic river values, these terms were defined in 2011. As planning is an iterative process, park planners promptly and thoroughly reassessed all alternatives once these terms were defined, to confirm that all action alternatives identified any river values experiencing adverse impact, degradation, or management concerns. Planners then revised the alternatives accordingly. This reassessment also ensured that the alternatives would reverse any downward trends and provide protection and enhancement of the river values.

#### **Step 4. Identify Management Concerns and Corrective Actions**

This step involves applying the definitions of river condition (management standard, adverse impact, degradation, and management concern, from step 3) to the existing river value conditions identified in step 2. By comparing the actual river condition to the management standard from step 3, park managers obtain a clear picture of which values need remedial action to bring them up to the management standard.

This step involved a systematic review of the river corridor to identify management concerns related to the free-flowing condition of the river, water quality, hydrologic/geologic, cultural, biological, recreational, and scenic ORVs. The planning team used scientific and geospatial data such as floodplain maps, visitor use surveys, and other monitoring information to support this review. The team also reviewed all of the public comments received during scoping to ensure that location-specific concerns were identified and paired with corrective measures. Finally, subject matter experts used their personal knowledge of the river system to supplement and clarify the findings of the baseline conditions report.

Using this information, managers then devised corrective actions, using the expertise of NPS subject matter experts, current research and monitoring information, the latest restoration techniques, and best professional judgment. The ecological restoration program (detailed in appendix H) forms the centerpiece of such restoration actions in the *Tuolumne River Plan/Draft EIS*, though there are others (such as removing some structures from riparian areas). Such actions must also correct past impacts, to the extent possible (some earlier impacts can be irreversible—it is possible that some of the effects of historic sheep grazing on Tuolumne Meadows may never be reversed, for example).

By identifying management concerns and corrective actions, managers ensured that all alternatives would protect and enhance river values. Indeed, such actions form the core of the alternatives.

#### **Step 5. Determine Location and Size of Necessary Facilities**

The WSRA guidelines state that, “Major public use facilities such as developed campgrounds, major visitor centers and administrative headquarters will, where feasible, be located outside the river area. If such facilities are necessary to provide for public use and/or to protect the river resource, and location outside the river area is infeasible, such facilities may be located within the river area provided they do not have an adverse effect on the values for which the river area was designated.”<sup>1</sup> Pursuant to this guideline, the National Park Service evaluated all existing major facilities and services within the river corridor for their necessity and relocation potential. A summary of the evaluation is provided in Appendix A: *Site Facility Analysis for the Tuolumne Wild and Scenic River Corridor*. This evaluation consisted of, first, examining facilities to determine if any were absolutely not essential (not directly related to the park mission). As explained in appendix A, no facilities met this description, so no facilities were removed across all alternatives. The second part of the examination consisted of determining whether facilities were necessary within the context of the visitor experience desired

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<sup>1</sup> 47 *Federal Register* 173: 39459, Sept. 7, 1988.

in an alternative (this part of the examination, then, can only be done after alternatives have been roughed out). In this case, several structures would be removed under alternative 1 to provide the self-reliant experience envisioned in that alternative; similarly, the gas station would be removed in alternatives 3 and 4 to provide additional space to accommodate the parking amounts envisioned in those alternatives.

As part of this step, park planners also evaluated the effects of existing facilities and services on river values. Any structures found to have negative effects were identified for removal, alteration to eliminate the effect, or mitigation. For example, the Tioga Road bridge over the Tuolumne River in Tuolumne Meadows has a small effect on the river's free-flowing condition, so all alternatives propose to modify the bridge to accommodate peak flows.

Also, extensive studies and site analyses were conducted at the primary visitor service areas (visitor center, Tuolumne Meadows campground, and Tuolumne Meadows Lodge) to identify other major site constraints that restrict development, redesign and/or relocation of facilities. Such constraints include the locations of floodplains, wetlands, meadows, riparian habitat, rare plants, archeological sites, historic structures, and areas of known impact. Park planners analyzed all existing structures to determine if they were causing impacts to such resources, and proposed mitigation measures or alterations to the structures to eliminate such effects. For example, the concessioner housing behind the store and grill is proposed for removal in all alternatives as it is located in a wetland.

## **Step 6. Solicit Public Input on Organizing Themes for Alternatives**

From the outset of the alternatives development process, park managers solicited public input into the scope of the plan. While such input is mentioned in some of the foregoing steps, it is singled out here because it was such a fundamental part of the alternatives development in this process. Public input was regularly sought throughout the project, from public scoping in 2006 through the public comment period on the draft EIS in 2012. Major topics discussed included outstandingly remarkable values, their conditions, and indicators for their monitoring; other planning issues the alternatives needed to address (such as water treatment at Glen Aulin); and organizing concepts or themes for the alternatives, site plan concepts, and the preliminary alternatives themselves.

Once a set of draft alternatives was developed, park managers specifically sought public input on those alternatives through two planning workbooks and several "Planner for a Day" workshops utilizing those workbooks. The first workbook, the *Tuolumne Planning Workbook (2007)*, described a set of four draft management alternatives. The workbook provided room for the public to comment on the draft alternatives and to create their own alternative plans. Following input received from the public, the planning team further refined these draft alternatives to develop a set of five action alternatives, presented in a second Tuolumne Planning Workbook in 2008. With the workbooks in hand, planners conducted more "Planner for a Day" Public workshops from 2007 and 2010 in Tuolumne Meadows, Yosemite Valley, El Portal, Lee Vining, and Groveland to discuss the alternatives and to provide an opportunity for the public to work with the same data being utilized by the planning team to move through incremental steps in the process of developing alternatives for the Tuolumne River Plan. Planners hosted site visits and webinars during the same timeframe. For a complete description of the public involvement history, please refer to chapter 9.

As noted above, early in the planning process, park planners were developing the alternatives around management zones that addressed the various concerns raised by the public and in the river value condition assessment. As the planning process progressed, the concept of organizing alternatives around zoning concepts

was discontinued, with the river values becoming the focus of planning attention and alternatives development. Still, some of the original zoning concepts presented to the public in 2007 and 2008 remain in the alternatives; for example, park employee housing is still clustered in certain zones (Bug Camp, Ranger Camp, Road Camp, and Tuolumne Meadows Lodge), with NPS and concessioner housing segregated from each other.

## **Step 7. Evaluate Operational and Implementation Feasibility of Draft Alternatives**

Once draft alternatives were completed, park planners put them through several rounds of review and critique by park managers, field staff, resource experts, and the public. Planners examined all site proposals and management actions, ensuring that no conflicts were present within individual alternatives. Through this analysis, planners realized, for example, that excessive housing was called for by one of the alternatives, so the housing levels were adjusted accordingly. Also, planners occasionally had to revise the draft alternatives to reflect new information or evolving on-the-ground situations. For example, a 2011 transportation study at Tuolumne Meadows indicated that many more cars were parking in undesignated locations than during the 2006 season, when the last parking study was conducted, so park planners adjusted the estimates of parking supply and demand accordingly.

Planners also developed cost estimates for the alternatives, subjecting those estimates to scrutiny as well. Through this analysis, planners realized that one draft alternative would be economically and operationally infeasible to implement. Consequently, the NPS eliminated it from further consideration (which dropped the number of action alternatives back down to four).

Most importantly, planners compared the preliminary alternatives to the constraints to which all alternatives were subject—wilderness boundaries, wild and scenic segment classification directives, site constraints like the presence of wetlands or rare plants, water withdrawal limits (for domestic consumption), and wilderness experience. Through this reanalysis, for example, planners realized that one iteration of alternative 2 would withdraw too much water from the Dana Fork of the Tuolumne River. Consequently, planners adjusted the proposals within that alternative to bring water consumption down to the water withdrawal constraints common to all alternatives (an estimated 70,000 gallons per day).

## **Step 8. Establish User Capacities Consistent with Protection of River Values**

The Wild and Scenic Rivers Act and Secretaries' Guidelines direct managing agencies to address user capacity and "the kinds and amounts of public use which the river area can sustain without impact to the values for which it was designated." Consequently, the last of the steps described herein—but again, not the last step completed; all steps can be taken concurrently and iteratively—is to establish the user capacities consistent with river value protection and enhancement, and the parameters of each alternative.

As with the other steps above, public input was a fundamental part of this step. During the scoping period for the Tuolumne River Plan, the NPS asked the public to describe what activities they enjoy in the Tuolumne River corridor, to help define the recreational ORV and begin to address the issue of kinds and amounts of use the river can sustain. The public scoping report (NPS 2006m) summarized public interest in different recreational uses, both those that members of the public would like to preserve as well as those that some would prefer to reduce or restrict. This feedback was complemented by contemporary research, constraint

maps, and best professional judgment, all of which provided up-to-date information into the types of activities and experiences visitors preferred.

User capacity experts developed a seven step process to address user capacity mandates (see chapter 6). They integrated that process into this alternative development process, which helped define the estimates of the maximum use levels sustainable in the Tuolumne River corridor, given the constraints present therein (wilderness boundaries and experience, water supply, and other resource constraints). Adjusting those use levels to the experiences envisioned within each alternative, planners produced a range of user capacities and recreation types, all within the existing constraints and all protective of river values. In one alternative, visitor use levels are much lower than current conditions, and some commercial activities would be reduced or removed. In other alternatives, the kinds and amounts of visitor use proposed requires expanding recreational opportunities and facilities, such as campgrounds and parking areas.

## Conclusion

Park managers and the public developed the four alternatives evaluated in this document by performing the tasks under each of the above steps, reviewing findings, and repeating the tasks as other steps were completed (necessitating revisions to earlier steps). The NPS has identified its preferred alternative, but all alternatives protect and enhance river values while providing for kinds and amounts of visitor use that are protective of river values. The alternatives represent a wide range of choices for future management of the Tuolumne Meadows area, from dramatically reduced use to expansion of use to the limits of the domestic water supply at Tuolumne Meadows (as explained in chapters 5, 6, and 7).

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*Back cover: Poopenaut Valley  
(Photo by Kristina Rylands)*

*Front cover: Tuolumne Meadows,  
Unicorn Peak and Cockscomb  
(Photo by Randy Fong)*