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Muir Woods National Monument Reservation System

Environmental Assessment



Golden Gate National Recreation Area

ATTN: Muir Woods Reservation EA

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Introduction

Background

In 1908, President Theodore Roosevelt established Muir Woods National Monument. The proclamation states that the monument contains “an extensive growth of redwood trees” that was “of extraordinary scientific interest and importance because of the primeval character of the forest in which it is located, and of the character, age and size of trees.” Muir Woods National Monument holds a significant place in conservation history and continues to preserve the character and integrity of the old growth forest.

In 2003, the National Park Service joined with the public and partner agencies to create a shared “Vision for the Future” for the Redwood Creek Watershed. The Vision for the Future “provides a foundation for land managers, residents and business to manage the watershed for its ecosystem function, local residents and visitors, educational opportunities, cultural and agricultural resources, recreation and rural character”. The Vision for the Future identified that “overcrowding in the parks and general traffic congestion were factors negatively impacting the public’s ability to enjoy the resources”. In the visitation for the future, NPS and its partners identified desired future conditions including that “visitor uses and levels are compatible with protection of natural and cultural resources of the watershed and visitor enjoyment” and “people visit the watershed in a manner that minimizes traffic congestion and its related negative impacts to communities and watershed resources.”

The most popular destination for the visiting public in the Redwood Creek Watershed is Muir Woods. As the number of visitors to Muir Woods National Monument (Muir Woods or the monument or park) continues to increase, the NPS realizes that steps must be taken to manage visitation levels in order to ensure a high level of protection of natural and cultural resources as well as to provide a positive and safe visitor experience. A variety of recent transportation and visitor studies have led the NPS to conclude that managing access by personal vehicles, shuttles, and commercial carriers is the most effective way to manage visitation levels. Several strategies have already been utilized to manage visitation levels, including expanding the Muir Woods Shuttle service, installing changeable message signs that inform visitors when parking is full, recommending visitors come during off-peak times, recommending other nearby redwood park experiences, and expanding multi-jurisdictional (i.e. county, state parks, NPS, CHP) parking management and law enforcement within the project area. Despite these measures visitation has continued to see substantial increases, particularly during peak season.

In 2015, The General Management Plan for the Golden Gate National Recreation Area and Muir Woods National Monument (GMP/EIS) was completed in January 2015 with the issuance of the Record of Decision. The GMP serves as the blueprint for the Golden Gate National Recreation Area (GGNRA) and for Muir Woods National Monument and provides goals, management strategies, and performance standards to be used to implement the plan. A key element in the GMP is the development and selection of indicators and standards that guide the types and levels of visitor use that can be accommodated in Muir Woods, while sustaining the quality of park resources and visitor experience consistent with the park purpose.

Purpose, Need, and Objectives

The purpose of the proposed action is to reduce peak visitation levels at Muir Woods by managing motorized vehicle access in order to achieve, in part, the Redwood Creek Watershed Vision for the Future, and meet goals identified in the GMP. The proposed action would allow the park to manage demand for parking both within the monument’s parking lots and on the adjacent road (Muir Woods Road which is owned and managed by the

County of Marin). Access would be managed to a level that meets goals while providing visitors with a high-quality arrival experience. The proposed action would also reduce the visitor crowding and traffic congestion currently experienced during peak periods at Muir Woods.

The management of visitation is needed in order to address the complex, longstanding problems with overcrowding and traffic congestion that visitors experience during peak periods. These conditions, caused by growing visitor demand, have resulted in a degraded visitor arrival and departure experience, with overcrowding and traffic congestion occurring during peak periods. These periods of high visitation have expanded in recent years and now occur throughout much of the year. Conditions visitors experience during these times include public safety risks, difficulty finding a parking space, long walks along Lower Muir Woods Road to reach the monument, and a general sense of overcrowding and frustration. These conditions detract from one of the principal park goals for the monument—providing an inspiring and contemplative experience. Additionally, traffic congestion affects nearby residents and neighbors of the monument, as well as County of Marin and California Department of Parks and Recreation (CDPR) resources.

Prevailing conditions do not meet the following park management goals outlined in the GMP:

- Create enjoyable and welcoming transportation experiences for all visitors.
- Preserve and protect park resources by minimizing transportation impacts.
- Create equitable and convenient multimodal transportation options to and within the park.
- Inspire environmental consciousness by demonstrating environmental excellence in transportation.
- Reduce greenhouse gas emissions.

A successful proposed action would achieve the following objectives:

- Manage visitation levels to reduce peak season overcrowding, preserve periods of lower levels of visitation on weekdays and off-peak periods, and meet associated visitor experience standards in the GMP.
- Manage motorized access to Muir Woods, including car, shuttle, and commercial tours buses to reduce traffic congestion in the park, enhance the protection of resources in the Redwood Creek watershed, and enhance overall visitor experience.
- Provide for continued vehicular access for park operations, staff, and local residents, as well as for emergency vehicles.
- Improve the ability for visitors to plan their trip to Muir Woods, adhere to their planned daily itinerary (which often includes other Northern California destinations) and make efficient use of their recreational time.
- Maintain equitable access for visitors, and charge no more than the reasonable fees necessary to manage transportation activities, along with the development of a complimentary access program for underserved communities.

Scope of the Environmental Assessment

This Environmental Assessment (EA) will analyze the No Action and Proposed Action alternatives and their respective potential impacts on the environment. The EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); the regulations of the Council on Environmental Quality

(CEQ) (40 Code of Federal Regulations [CFR] 1508.9); NPS Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making; the National Historic Preservation Act of 1966, as amended (NHPA); and the Endangered Species Act of 1973, as amended. The assessment of effect analyzes potential effects of historic properties under section 106 of the NHPA.

Connected Action (40 CFR Sec. 1508.25): The proposed action is related to but not dependent upon the following project that is planned in the vicinity by the NPS and other public agencies:

- Muir Woods Site Improvements (NPS project)– Project would improve the entry and arrival visitor facilities for the monument, including parking lots, pedestrian trails, gathering spaces, improved restrooms, and vehicle loading/unloading areas. The compliance process for this project began in 2013 and is ongoing, with construction anticipated in 2018-2021.

The proposed Reservation System for Muir Woods:

- does not trigger another action;
- can proceed independently of future site improvements because implementing a reservation system now addresses existing concerns regarding parking and transportation regardless of whether the site improvements proposed in the Site Improvement Scoping Notice are undertaken ;
- is not reliant on the implementation of the proposed actions described in the scoping notice for Muir Woods Site Improvements;
- and does not depend on the proposed Site Improvement actions for its justification;

This proposed action meets the "independent utility" test in that the implementation would take place with or without the implementation of any other action.

Alternatives

Alternative A – No Action

Alternative A, or the No Action Alternative, would leave existing access to Muir Woods unchanged by the NPS. Under this alternative, visitation to Muir Woods would be expected to increase by approximately 1% growth per year or an increase from an estimate of 1,000,747 visitors in 2014 to a projection of 1,031,000 visitors in 2017. Existing access could be described as managed, but relatively unregulated. Visitors would continue to be encouraged through the Muir Woods website, signs, and other media to visit during off-peak hours and use alternative forms of transportation such as public transit (e.g., the Muir Woods Shuttle) and commercial tours. Enforcement of parking regulations along Muir Woods Road would continue to be coordinated with the County of Marin Sheriff and California Department of Parks and Recreation with limited participation from NPS, to reduce parking in illegal, unsafe, and/or resource-damaging areas. This alternative assumes that the county will enforce parking restrictions that it has established on Muir Woods Road, including reduction of parking supply to approximately 110.

Alternative B – Proposed Action/Preferred Alternative

Under Alternative B, which is the Proposed Action or Preferred Alternative, the NPS would actively manage access to Muir Woods through establishment of a reservation system for all modes of motorized access to Muir Woods. The reservation system (hereinafter referred to as “reservation system” or “system”) includes two

separate, but coordinated systems. Reservations for personal occupancy vehicle (POV) and for the Muir Woods Shuttle would be made through directly through a reservation system operated by a third-party operator. Commercial carriers would be required to obtain a reservation for one of the parking spaces designated for commercial carrier use through another, separately-managed system.

Parking in Muir Woods and on Muir Woods Road would be formalized and regulated in order to effectively manage the reservation system. The number of parking spaces that would be managed by the reservation system would be approximately 232 visitor spaces (personal occupant vehicle), and 16 commercial vehicle spaces. These spaces would include:

- Parking within Muir Woods National Monument,
- Parking along select portions of Muir Woods Road, as shown in Figure 1 (Parking Management Corridor) and described in the Memorandum of Understanding between the NPS and County of Marin (Appendix B) (here therein referred to as “MOU”),

Annual visitation is expected to be reduced from the estimated 1,000,747 visitors in 2014 to a projection of 924,400 visitors in 2017. The reservation system would manage demand for parking and also reduce peak period visitation. The number of reservations released by the system would be managed to ensure that monument visitation levels are maintained at or below those identified in Figure 2. This level of visitation would meet the goals and performance standards in the GMP and serve to ensure protection of park resources and visitor experience by managing to visitation levels consistent with the GMP, and Figure 2. The number of reservations issued per day would be adjusted based on information from on-going monitoring of transportation, resource, and visitor experience conditions as well as to ensure visitation is at or below those in Figure 2.

Reservations would be made through a website and a call center, both operated by a third-party operator selected by the NPS through a competitive bid process. In addition, in cooperation with Marin Transit, existing shuttle service to the monument would be expanded. Parking management services and operation of the reservation system would be funded through a new concession service charge to visitors and/or a transportation fee. The fee would be tied to the cost of providing these services, which has been estimated to be approximately \$3.00 per visitor on average. A more detailed explanation of these costs is discussed in the Visitor Use section of Chapter 4.

Reservations will be administered in alignment with GGNRA education and outreach goals, which may include complimentary reservations for target groups as approved by GGNRA leadership. Complimentary reservation programs would be coordinated with other entrance fee programs and event programs as appropriate.

The proposed action includes, but is not limited to, all federal actions included in the MOU (Appendix B). The NPS would be able to fully execute the MOU at the conclusion of this EA. The federal actions under this alternative, including those within the MOU are below. It should be noted that actions in the MOU that are not listed below, were excluded because they are not considered actions under NEPA (e.g. attending meetings, supplying regulations to CUA operators, etc). All actions in the MOU would be implemented under this alternative.

Phase 1

Prior to the reservation system being launched, a series of preliminary actions would be implemented that support the system’s operations and in meeting the project’s goals. The actions in this phase include:

- Reduction of parking on Muir Woods Road to approximately 110, with approximately 80 downstream of the concrete bridge (See Figure 1).
- Placement of physical barriers and signage along Muir Woods Road between Panoramic Highway and Highway 1 to prevent vehicles from parking illegally. The barriers will support enforcement of the parking supply limits allowed in the MOU (Appendix B). The physical barriers will include placement of a combination of posts and post-and-cable fencing approximately two feet off the fog line of the road, as well as other minor improvements to ensure compliance of parking restrictions. The extent and placement of these measures will be determined by mutual agreement between the National Park Service and County of Marin; however, because the road is owned and maintained by the County, they retain authority and must permit these actions.
- In the Conlon Avenue area within Muir Woods, a set of maintenance and modest improvement actions would be taken. These would include light grading of approximately 20,000 square feet of currently disturbed area (currently used as overflow parking and maintenance bone yard), laying down of gravel base, installing wattles and other stormwater BMP's, widening the driveway into the area to improve emergency vehicle access, and removal of 1 tree, which is showing evidence of sudden oak death. The tree would be removed and disposed of according to standard practice for trees with that disease.
- Installation of a small, temporary visitor contact station near the entrance of Muir Woods for on-site parking management staff to answer visitor questions related to reservations and parking, and to store any equipment they need to conduct their work (radios, computer, phone, etc.). The location has not been specifically identified, but will occur on NPS property.
- Provide additional NPS Law Enforcement Ranger capacity (equivalent to 1 full time person) for parking enforcement and management within Muir Woods National Monument and along the Parking Enforcement Corridor and assume primary responsibility for parking management and enforcement along that corridor beginning no later than January 1, 2016.
- Coordinate with CDPR to ensure annual non-toxic vegetation management for safety purposes within the right-of-way in areas where physical barriers prevent efficient access by County Road Maintenance staff.

Phase 2

This phase of the project includes the following actions associated with starting and operating the reservation system for the first 2.5 years. In general, these actions will include the operation and management of the reservation system, enforcing parking restrictions along the entire length of Muir Woods Road, performing routine maintenance, and implementing a monitoring plan. The specific actions include:

- Implementation of a transportation reservation system to manage motorized access to the monument, including Muir Woods Road, (website, call center, parking management, parking enforcement, etc.). A third-party operator would be selected through the competitive federal government prospectus process; the selected operator would develop and implement the transportation reservation system to manage motorized access to the monument, with oversight by the NPS.
 - Require reserved permit parking in the area defined in the Parking Management Corridor and in the NPS Muir Woods parking lots in accordance with the MOU. Parking on the road would not

- exceed approximately 110, with approximately 80 downstream of the concrete bridge during this phase.
- Collect and retain reservation/permit fees from Muir Woods visitors to support the system's operation and other obligations in the MOU.
 - Manage the reservation system resulting in visitation levels that are at or below those identified in Figure 2
 - Prohibit bus parking along Muir Woods Road and require tour bus operators to secure a reservation.
 - Manage changeable message signs (CMS) along Highway 101 and other State or local roads to support the reservation system.
 - Provide information on its website and public service announcements to inform visitors of the need to secure a reservation.
- Assume routine day-to-day operational responsibilities within the Parking Management Corridor on Muir Woods Road, which includes, but is not limited to, parking management, non-toxic vegetation management, litter collection, and routine maintenance (surface treatment) of shoulder and pedestrian areas.
 - Upon commencement of the reservation system, provide one additional NPS Law Enforcement Ranger capacity (equivalent to 1 full time person, for a total of 2 full time employees) for routine day to day operational responsibilities for parking enforcement and management within Muir Woods National Monument and along the Parking Enforcement Corridor. To acknowledge that by providing the NPS with the authority necessary to enforce traffic and parking regulations throughout the Parking Enforcement Corridor, the Sheriff does not relinquish or reduce any of its existing authority to perform these functions during the entire term of the MOU.
 - Implementation of a monitoring and adaptive management program to track how effectively the reservation system is meeting GMP performance standards and adjusting (GMP, Vol 1, pg. 289-295). If the established performance standards are not being met the reservation system would be modified. Specific measures to be monitored would include:
 - hourly and daily vehicle and visitor arrival rates, including POV's, buses, shuttles and pedestrians;
 - Visitor metrics and level of service within the monument arrival plaza;
 - visitor use metrics inside the monument (i.e., people at one time, people per view, encounters on trails, noise levels, and social trails).

Phase 3

This phase of the project is for the second 2.5 years of operation of the reservation system. It includes the same actions as Phase 2, but parking on Muir Woods Road is reduced to approximately 70, with approximately 40 downstream of the Concrete Bridge. The exception to these limits is that during periods of construction on projects within the Muir Woods area that displaces vehicles parked elsewhere in the watershed, up to 80 vehicles may be parked downstream of the bridge.

Phase 4

This phase of the project extends from the conclusion of year 5 of the reservation system through year 20. It includes the same actions as Phase 2, but parking on Muir Woods Road is reduced to approximately 30, with none downstream of the Concrete Bridge.

Figure 1. Parking Management Corridor for Muir Woods National Monument

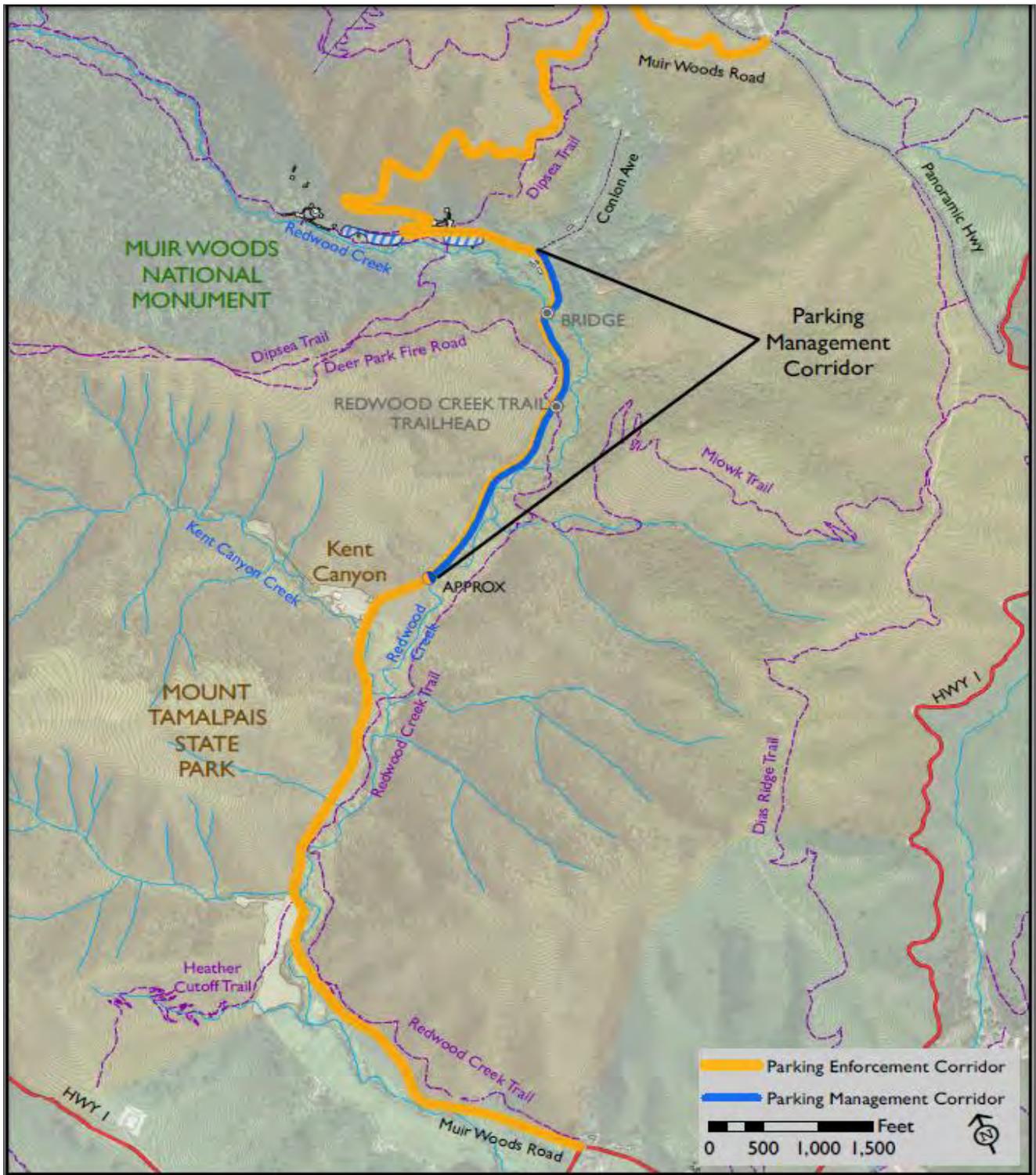
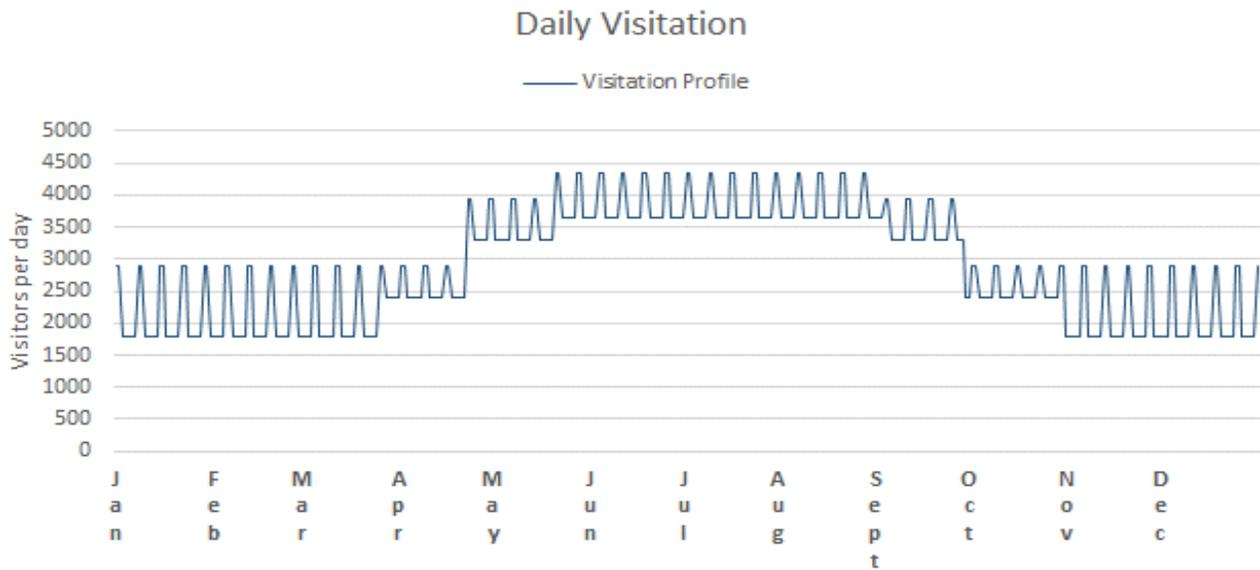


Figure 2. Daily Visitation Capacity for Muir Woods National Monument (MOU)



Alternatives Considered and Dismissed from Further Analysis

Expanded Shuttle and Information Systems (without Reservation System)

As an alternative, the NPS considered significantly expanding the existing Muir Woods Shuttle to reduce personal vehicle trips and manage overall demand, as the sole proposed action. The NPS began operating the Muir Woods Shuttle in cooperation with Marin Transit in 2005. Service has expanded significantly over the shuttle’s ten years of operation. Marin Transit and the NPS have increased the number of coaches and the frequency of trips to and from the monument, as well as modified routes to improve efficiency. In tandem with the shuttle service, the NPS has installed changeable message signs on highway approaches, as well as through messages on the NPS website about when parking is full. Ridership has increased more than tenfold since the service’s inception, from carrying fewer than 5,000 visitors to and from the monument in 2006, to carrying over 50,200 in 2014. The shuttle currently operates 10 coaches during peak periods, with shuttle frequency every 10 minutes. On days of operation during peak season, the shuttle provides transportation for 20–25% of Muir Woods’ visitors.

Despite increases in shuttle ridership, annual visitation to the monument via all other transportation modes has increased at an even faster rate. Over the period the shuttle has been operational, overall visitation has risen from approximately 775,000 visitors in 2005 to approximately 1,000,747 visitors in 2014, an increase of approximately 226,000 visitors. During the same period, shuttle ridership has increased from 0 to 50,200 (visitor round trips). The net difference between these numbers, approximately 176,000 annually, have predominantly come by personal vehicles. The shuttle service has become an integral component of the Muir Woods transportation system, but it has not reduced vehicle trips sufficiently, due to the lack of a system in place to control overall visitor demand. For this reason, this alternative would not meet project objectives.

Impact Topics Retained for Further Analysis

The following impact topics were retained for further analysis. These topics were identified on the basis of federal laws, regulations, and orders; NPS Management Policies (2006); and NPS knowledge of resources at Muir

Woods. Impact topics that were retained for further analysis were those that would result in impacts greater than minor, negative or beneficial.

Visitor Use and Visitor Experience

Providing appropriate, high-quality opportunities for visitors to enjoy the parks is a fundamental purpose of the NPS. These opportunities for enjoyment are directed to be uniquely suited and appropriate to the natural and cultural resources found in the parks. The project will enhance the ways in which visitors utilize Muir Woods by providing easier transportation access, reducing traffic congestion and the frustrations surrounding being unable to park within a reasonable walking distance, as well as by enhancing the opportunity for public enjoyment of the beauty, serenity, and sounds of nature within the monument.

This impact topic is also where the concept of carrying capacity is described. Visitor carrying capacity is the type and level of visitor use that can be accommodated while sustaining the desired resource and visitor experience conditions in the park (NPS Management Policies, 2006). The carrying capacity for Muir Woods, referred to as user capacity, has been analyzed and documented in the GMP, Volume 1, pg. 289-295. The proposed action is directly related to achieving the standards described in the GMP. The impacts from this action on Visitor Use and Visitor Experience will be substantially beneficial.

Transportation

As part of its Management Policies the NPS is directed to find transportation solutions that will preserve the natural and cultural resources in its care while providing a high-quality visitor experience. Implementation of the proposed action would result in a decrease in the number of vehicles being driven to the monument, which in turn would also reduce traffic and congestion in the surrounding areas and enable the desired visitor experience to be maintained. The impacts from this action on Transportation will be substantially beneficial.

Impact Topics Dismissed from Further Analysis

The impact topics described below have not been considered further in this EA because the environmental impacts associated with the issue or impact topic are unlikely to occur, are not potentially significant, or do not differ among alternatives in any meaningful way.

Water Quality

Reduced shoulder parking would occur in both alternatives and would have negligible effects on the areas contributing to runoff; buffer zones would increase slightly, but benefits are expected to be minor. The Redwood Creek Watershed Assessment (NPS 2011b), did not identify any water quality problems in the watershed associated with parking in the watershed, including on Muir Woods Road. Reduction of parking on the road is therefore unlikely to improve water quality from non-point source storm water pollutants or improve overall water quality.

Threatened or Endangered Species

Neither of the alternatives will negatively impact nor benefit local threatened or endangered species, including the northern spotted owl, coho salmon, or steelhead trout. The decline of migratory fish species has been associated with a number of factors including modification of habitat, habitat loss, water pollution, over utilization (for a number of purposes, including commercial and recreational fishing), disease and predation, oceanic conditions, and drought, according to the National Oceanic and Atmospheric Association, Marine Fisheries Service's Coho Salmon Recovery Plan (NOAA 2012). The NPS, in partnership with local, state, and other federal agencies and other non-governmental organizations, have been implementing a series of projects and programs to improve and restore habitat and conditions for these species, however, this project will not have a substantial impact, beneficial or negatively on them.

Wildlife Habitat

Reduction of roadside parking would not have notable impacts to wildlife habitat. The Redwood Creek habitat has been affected by a number of factors including human modification, habitat loss, water pollution, and low water volume (NPS 2011b). The NPS, in partnership with local, state, and other federal agencies and other non-governmental organizations, have been implementing a series of projects and programs to improve and restore habitat, however, the proposed action will not have a substantial impact, beneficial or negatively.

Vegetation

The proposed action would eliminate parking in inappropriate locations along Muir Woods Road, which would allow some regrowth of native vegetation along roadsides, a minor beneficial impact. There would be negligible impacts associated with installation a physical barriers along Muir Woods Road, as well as from actions in the Conlon Avenue parking area. This would include minimal trimming, pruning, and removal of 1 tree, which is showing evidence of sudden oak death. The tree would be removed and disposed of according to standard practice for trees with that disease. All vegetation actions would occur outside of bird nesting season. Because the impacts associated with vegetation are extremely limited this impact topic has been dismissed from further analysis.

Geology: Soils, Bedrock, Streambeds

Reduced roadside parking would reduce potential contribution to runoff and erosion along Muir Woods Road. No changes to the road itself are proposed within this project. However, the installation of erosion protection measures along with the physical barriers that are planned to be installed on the road shoulder to prevent illegal parking; the impacts associated with that would be minor and only beneficial. Routine maintenance and widening of driveway access to improve safety at Conlon Avenue (currently a maintenance and parking area) (including light grading, laying of gravel, and installing stormwater management measures such as wattles) will reduce the potential of sedimentation into the Redwood creek or its tributary.

Air Quality

The number of vehicle trips, including a modest expansion of the shuttle system, to the monument will be reduced under the proposed action. This is expected to result in both reduced vehicle miles traveled, less congestion, and fewer cars circling or idle while waiting for a parking spot to become available. This would reduce emissions of air pollutants and be a minor beneficial impact.

Soundscapes

The number of vehicle trips, including a modest expansion of the shuttle system, to the monument will be reduced under the proposed action. This is expected to result in both reduced vehicle miles traveled, less congestion, and fewer cars circling or idle while waiting for a parking spot to become available. This would reduce vehicle-related acoustic impacts and be a minor beneficial impact to the monument's soundscape.

Cultural Resources

The area of Muir Woods is considered an important cultural landscape and careful attention is paid to how this area is interpreted and affected by proposed projects in relation to potential impacts to the landscape. Neither of the alternatives would alter the cultural landscape in any significant way.

There are no known Native American sacred or culturally sensitive sites, locales (such as clan gathering or other cultural event), or landscapes present in the project area. Additionally, implementation of the project is extremely unlikely to disturb human remains, funerary objects, sacred objects, or objects of cultural patrimony, as defined by the Native American Graves Protection and Repatriation Act (NAGPRA).

Viewscapes

Placement of fencing and signs would have an effect on the viewshed in area. However, the proposed posts and fencing will be 30 inches in height or less and are not considered to substantially affect the viewscapes in the corridor. The impacts to viewscapes of these actions are expected to be minor.

Nightsky

The proposed action will have no effect on night skies.

Affected Environment and Environmental Consequences

Introduction

In this EA, the Affected Environment and Environmental Consequences sections have been combined. The Affected Environment describes the area and resources that could be potentially impacted by implementation of either of the alternatives. The Environmental Consequences describe the direct, indirect, and cumulative impacts to those resources from the actions proposed in the alternatives. The sections are organized by impact topic, with the alternatives included as sub-headings.

Methodology for Assessing Impacts

Topics analyzed in this chapter consist of Visitor Use, Visitor Experience, and Transportation.

Direct, indirect, and cumulative impacts are analyzed for each of these resource topics. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are as follows:

- **Type** describes the classification of the impact as either beneficial or adverse, and as either direct or indirect.
 - *Beneficial*: A positive change in the condition or appearance of the resource, or a change that moves the resource towards a desired condition.
 - *Adverse*: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
 - *Direct*: An effect that is caused by an action and that occurs in the same time and place.
 - *Indirect*: An effect that is caused by an action that is later in time and further removed in distance, but that is still reasonably foreseeable.
- **Context** describes the area or location in which the impact will occur.
- **Duration** describes the length of time an impact will occur, either short-term or long-term. Because definitions of short-term and long-term can differ by resource topic, definitions of these terms are provided separately for each topic.
- **Intensity** describes the degree, level, or strength of an impact.

Cumulative Impacts

CEQ regulations implementing NEPA require assessment of cumulative impacts in the decision-making process for federal projects. A cumulative effect is described in the CEQ regulations (1508.7) as: the impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action. Cumulative impacts can result from individually minor, but collectively significant, actions

taking place over a period of time. To determine potential cumulative impacts, projects within the project area and surrounding the area were identified. Potential projects identified as cumulative actions include any planning or development activity that has been completed, that is currently being implemented, or that will be implemented in the reasonably foreseeable future that could affect the same resources as the alternatives analyzed. These include the following:

- All County of Marin actions in the MOU (Appendix B).
- Muir Woods Water/Wastewater Infrastructure Rehabilitation (NPS project) – This project would renovate existing water and wastewater infrastructure between the visitor center and Conlon Ave, including supply and collection and is expected to occur in 2017 or 2018.
- Muir Woods Site Improvements (NPS project)– This project would improve the entry and arrival visitor facilities for the monument, including parking lots, pedestrian trails, gathering spaces, improved restrooms, and vehicle loading/unloading areas. The compliance process for this project began in 2013 and is ongoing, with construction anticipated in 2018-2021.
- Muir Woods Road Concrete Bridge Rehabilitation (County of Marin project) – This project would rehabilitate the existing bridge over Redwood Creek which has been determined to be structurally deficient. Construction is anticipated in 2018.
- Muir Woods Road Rehabilitation Project (County of Marin project) – This project would repair current and emerging slumps that are impacting the structural integrity of Muir Woods Road, improving culverts and stormwater management, and rehabilitation the road between Muir Woods’ entrance and Highway 1. Construction is anticipated in 2018.
- Muir Woods Entrance Fee Increase (NPS)– In 2016, the NPS will raise the Muir Woods entry fee from \$7 to \$10 per visitor. This increase was part of an NPS nationwide fee adjustment to support operations and address on-going funding shortfalls, particularly in deferred maintenance of critical assets such as buildings, visitor centers and trails.

The impacts of these actions are evaluated in the cumulative impact analysis in conjunction with the impacts of each alternative to determine if they would have any additive effects on visitor use, visitor experience, or transportation.

Visitor Use and Experience

Affected Environment

The visitor experience conditions at Muir Woods are very closely related to the visitor use and transportation conditions. Substantial and recurring high daily visitation levels have had a substantial impact on the visitor experience at Muir Woods. Visitation levels and arrival rates that exceed the monument’s user capacity (see Carrying Capacity section, and/or GMP, Chapter 7) result in the following visitor experience problems:

- Parking in illegal or unsafe areas
- Visitors walking long distances and/or in unsafe areas, including in the travel lanes of Muir Woods Road
- Congestion in the parking lots, creating driver frustration
- Crowding in the arrival experience and within the monument
- Excessive noise
- Reduced opportunities to appreciate the beauty, serenity, and sounds of nature within the monument.

Managing the visitation to levels and rates that meet the GMP user capacity of Muir Woods is among the key goals and objectives of the GMP.

User Capacity

Chapter 7 of the GMP, *User Capacity*, includes specific performance indicators and standards to inform decision making on levels of visitation. The indicators for Muir Woods are associated with issues of resource protection and with crowding and congestion. The GMP establishes desired conditions, management levels, and standards for resources and visitor experience in the monument. The GMP focus is on user capacity for the different management zones within Muir Woods, but a need also exists to set and monitor overall monument user capacity planning ranges to support transportation planning and other initiatives at the monument. As a starting point for this effort—which is recognized as an ongoing process—this EA defines user capacity terms, summarizes relevant past research and data collection, provides an analytical basis for relating location-specific user capacity data to park use levels, and discusses strategies to monitor and manage those ranges to achieve desired resource conditions and visitor opportunities.

The NPS defines user capacity as the types and levels of visitor and other public use that can be accommodated while sustaining the desired resource conditions, social conditions, and visitor experiences that complement the purpose of a park (NPS 2009). This definition acknowledges that desired resource conditions and visitor experiences are often related to a variety of factors, and not merely to the number of people. User capacity involves issues such as how people get to a park, what they do at the park, where they do it, how long they stay, and what impact their activities have on park resources and the experience of other visitors. The term user capacity also conveys the concept that capacity is applicable to all public park users, including subsistence users and other local residents.

Central to this flexible visitor use planning approach is the process of defining the desired conditions, along with the indicators and standards to be monitored in order to measure success in achieving and maintaining desired resource and visitor experience conditions. This process involves considering and incorporating all available and relevant information including research, public input, and management judgments, and evolving the indicators and standards as monitoring and facility and visitor use changes inform the process over time.

Desired conditions describe the future conditions that will best fulfill the statutory requirements, align with the park purpose and significance, and allow present and future opportunities for public enjoyment of the park. Desired conditions are established by management zone in order to take into account the resources, development (infrastructure), access, kinds and levels of use and management, and focus of the particular area.

Indicators are defined as specific measurable physical, ecological, or social variables that reflect the condition or visitor experience of an area. Sources of potential indicators include scientific literature and research, public opinion, and management knowledge.

Standards are defined as the minimum acceptable condition for an indicator of a desired condition. Standards define the point at which conditions (indicators) trigger management action, and they need to be set at a level that will be consistent with the desired conditions for the zone (NPS 2009). Standards need to be quantitative and specific, but even with detailed research there is rarely a conclusively definitive standard because research is based partly on visitor's subjective perceptions. Therefore, standards are generally based on the best professional judgment of management using the best available data and are revised and refined as additional data become available.

The priority resource indicators described in the GMP include issues with informal trails, soundscapes from human-caused noise, evidence of visitor-caused wear or disturbance to the redwood trees, and the amount and distribution of invasive species. Each of these topics is discussed further below.

Informal trails – Proliferation of informal trails is not currently a serious problem, because the NPS has greatly increased efforts to clearly delineate designated trails and to educate visitors to stay on trails (GMP 2015). Instances of informal trails are evident in the areas near parking along Muir Woods Road and are an issue primarily during peak periods, when parking is over-utilized in designated areas.

Soundscapes from human-caused noise – Measures that have been employed by the NPS to manage soundscape include the introduction of “quiet zones” in the monument and the education/encouragement of visitors through signs and at the entry gate to voluntarily protect the soundscape (GMP 2015).

Evidence of visitor-caused wear or disturbance to the redwood trees – Evidence of impacts to the redwood trees from visitor use is minimal. Areas that have seen impacts are located along established trails. In order to reduce/eliminate this impact, the NPS has been constructing boardwalks and railings in order to reduce the impacts to tree roots from trails, particularly in the more frequently visited areas of the monument.

Invasive species – Visitor use is not the only or even primary source of invasive species; however, such species can be spread through visitor use. The NPS Inventory and Monitoring Program has been monitoring the number of detections and the extent of cover of invasive species as part of the Vital Signs Program. The goal of the program is to target new or expanding infestations. If monitoring detects a change in the number or extent of invasive species, then a problem analysis would be needed to isolate the causal factors. If visitor use were determined to be a contributing factor to the observed change in conditions, then appropriate visitor use management strategies would be identified and implemented. Some of the management activities that the NPS has been employing in relation to this issue include educating visitors to stay on trails, clearly marking designated trails, and restricting activities that might increase the introduction of invasive species (GMP 2015).

The priority social indicators identified in the GMP include density and event-based metrics: people at one time (PAOT), people per view (PPV), and encounters along trails. Specific standards and indicators for these metrics were established using surveys and models to identify the maximum acceptable levels (numbers of visitors above which management actions should be initiated) for these metrics at Muir Woods. The GMP indicators and standards were developed from 2003/2004 and 2009 Muir Woods visitation studies, as well as NPS staff knowledge of conditions, input from user capacity experts Drs. Manning and Lawson, the output of similar PAOT research at Yosemite National Park, and national standards for Level of Service developed by the National Transportation Safety Board. Indicators and standards were selected based on their level of importance for protecting Muir Woods’ purpose, significance, fundamental resources and values and associated desired conditions, and the clarity of connection between human use and impact of concern (crowding and congestion). The feasibility of each indicator (relationship to an existing monitoring effort) and how well the indicator would provide useful management information on the amount, location, timing and/or behavior of visitor use were also considered.

Crowding and congestion indicators and standards were established based on the median value of surveyed visitors’ subjective perceptions of a limited selection of crowding conditions, so there is an equal probability of the value being higher or lower than the standard. They were also established with the understanding that there will be tradeoffs and implications. For example, since standards are defined as the point at which certain conditions (indicators) become unacceptable, then the question is how often to avoid this situation. In most cases, a park will be doing well if it can avoid unacceptable social conditions 90% of the time. The 90% probability of conditions being at or above standard allows for 10% of the time to include random or unusual events (e.g., holiday weekends) that might prevent management from providing these conditions. This also allows for the complexity and randomness inherent in visitor use patterns, which is most relevant for social standards (NPS 2009).

Several analysis approaches demonstrate a strong correlation between social conditions and daily visitor use levels, and point to those visitation levels at which social indicators and standards established in the GMP will most typically be reached. Simulations and regression analyses performed using Muir Woods research data suggest that the maximum daily use levels to maintain the GMP standards fall within a range of 3,550 to 4,860 daily visitation. This suggests that the average of this range, 4,205 daily visitation, is an appropriate initial maximum user capacity planning standard, with the NPS striving to maintain no more than 10% of days above this limit. The monitoring program will continue to track conditions in relation to these GMP standards and will take management action to address issues per guidance in the GMP and NPS management policies.

Impacts of Alternative A – No Action

Under Alternative A, visitation levels are expected to continue to increase by approximately 1% per year. Visitation growth has averaged approximately 1.5% annually over the last 15 years; however, the NPS is forecasting a lower average growth rate over time to adjust for the recent spike in growth rates (6.4% growth 2010–14) that may be skewing the data upward. Annual visitation based on 1% annual growth is expected to increase from 1,000,747 visitors in 2014 to 1,031,000 visitors in 2017. Visitation levels have already reached levels at which the GMP's standards are being exceeded on a frequent basis. The GMP specifies that these standards should not be exceeded on more than 10% of the days in a year (i.e., 36 days); in 2014, the standards were exceeded on 69 days, or 19% of the year. It is anticipated that even higher visitation levels in future years will result in an increased frequency in the number of occurrences during which the GMP standards are exceeded. In 2017, it is forecast that the number of days during which the GMP standards are exceeded will increase to 74 days (20%), and in 2022, 85 days (23%).

These levels of visitation will result in continuing and increasing vehicular congestion levels in the watershed, both in the monument's parking lots and on Upper and Lower Muir Woods Road. In addition, whenever parking demand is substantially higher than supply, informal parking in illegal and unsafe locations will increase, with visitors walking longer distances in unsafe conditions and creating informal trails in the park that damage resources.

Cumulative Impacts

Under Alternative A, cumulative impacts to Visitor Use will be affected by construction of projects in the project area (page 13). These impacts would likely last through the entire period of construction (~5 months per year 2018-2021) and the intensity of the impacts would be serious. Without the ability to manage vehicle trips into the construction zones, areas that are currently very congested will be even more so. This could lead to extensive delays, driver/visitor frustration, safety problems, creation of new social trails, resource impacts, and delays and added costs to construction operations.

Impacts of Alternative B – Proposed Action/Preferred Alternative (Environmentally Preferable Alternative)

Days of extremely high daily visitation levels (> 4,500) would be minimized or eliminated. Visitation would be more evenly distributed over the course of a day, with a reduced numbers of visitors per hour during peak times of the day. These actions would bring visitor use levels into alignment with the GMP performance indicators and standards. By reducing peak period arrival rates, combined with active monitoring and adjustments to the number of reservations, the NPS would have the ability to better meet operational needs and ensure that visitor experience and other visitor-related impacts to resources are kept within standards.

Under Alternative B, annual visitation is expected to be reduced from 1,000,747 visitors in 2014 to 924,400 visitors in 2017. By managing demand and reducing peak period visitation levels through the reservation system, the Proposed Action would bring Muir Woods into compliance with the criterion of having no more than 10% of the days in excess of the performance standards and indicators as defined in Chapter 7 of the GMP. The

Proposed Action would further limit exceedance occurrences below the 10% per year allowed (36 days, 10%) to 30 days maximum (9%). Exceedance occurrences of the indicators and standards are forecast to be 29 days (8%) in 2017 and 30 days (9%) in 2022 under this alternative. This level would be maintained over time or reduced if needed to respond to other visitor-related resource impacts. These levels of visitation would result in visitation levels consistent with the GMP standards that can be sustained over time, providing improved visitor experience, improved safety, and reduced visitor-related natural resource impacts.

The changes to visitor use describe above will have a corresponding change to the visitor experience. The Proposed Action will reduce peak-hour visitation by as much as 40-45% during peak period weekends when visitation is at its highest, and by approximately 20-30% on off-peak season weekends. Similarly, daily vehicle trips would be reduced by as much as 32% in July, when visitation is at its highest, and by approximately 2% during the slowest month (January). These reductions in vehicle trips would reduce impacts to transportation facilities at the monument and on local and state highway approaches. In addition, these reductions will reduce, and eventually enable the phasing out (over 7 years) of informal parking on Muir Woods Road downstream of the Concrete Bridge, which is the least safe parking area and is the furthest distance from the monument.

Recreational activities within the monument would not be substantially altered. As described above, the Proposed Action would minimize or eliminate visitation levels during which the GMP standards are not satisfied, resulting in an overall improved visitor experience. Also, the reduced number of visitors would be more evenly distributed over the course of a day, reducing the number of visitors per hour during the peak period and further improving the visitor experience. The Proposed Action would also result in an elimination of parking on Muir Woods Road outside the Muir Woods boundaries over the course of seven years, improving safety and shortening the distance visitors must walk between their parked cars and the monument entrance. Visitor access via hiking, bicycling, and commercial tour bus would remain largely unchanged. Unlike current conditions, the reservation system would provide certainty of safe and convenient access to the monument.

Figure 3 and **Figure 4** compare the projected visitation in 2017 under the Preferred Alternative versus the No Action Alternative. The forecasts assume demand for visitation will increase by 1% per year, using 2014 as the baseline year.¹

¹ Forecasts blend daily visitation for 2012–2014 to reduce daily visitation variability attributable to weather or other factors and improve the accuracy of the forecast.

Figure 3 Comparison of projected Visitation under the Preferred Alternative and the No Action Alternative (NPS)

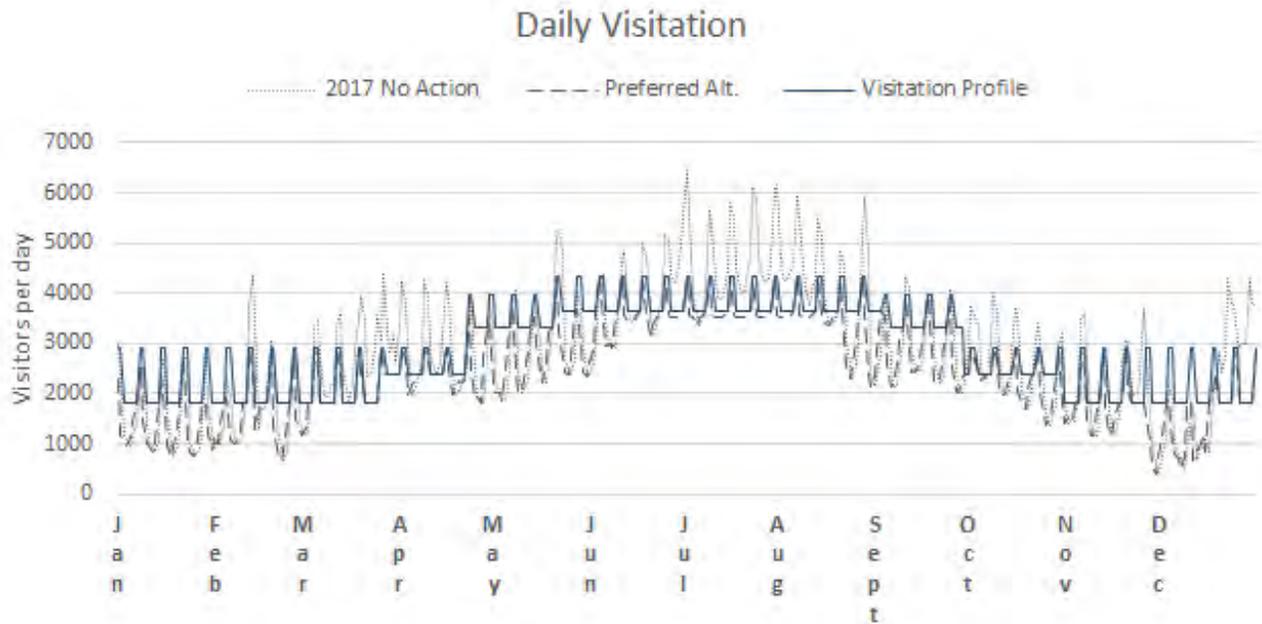


Figure 4. Estimated Average Daily Visitation (all modes) under the Preferred and No Action Alternatives

Visitation												
	January	February	March	April	May	June	July	August	September	October	November	December
Average Daily Visitation												
<u>All Days</u>												
No Action	1549	1853	2690	2889	3022	3849	4691	4202	2876	2624	2061	2061
Preferred Alt	1548	1683	2110	2529	2902	3602	3846	3636	2852	2336	1831	1530
% diff.	0%	-9%	-22%	-12%	-4%	-6%	-18%	-13%	-1%	-11%	-11%	-26%
<u>Weekends</u>												
No Action	2518	2976	3577	3966	4119	4768	5804	5409	3945	3484	2899	2488
Preferred Alt	2514	2668	2900	3154	3877	4339	4350	4350	3855	2900	2701	2281
% diff.	0%	-10%	-19%	-20%	-6%	-9%	-25%	-20%	-2%	-17%	-7%	-8%
<u>Weekdays</u>												
No Action	1088	1403	2382	2427	2573	3515	4214	3708	2487	2215	1756	1895
Preferred Alt	1088	1289	1835	2262	2504	3334	3630	3344	2487	2067	1515	1237
% diff.	0%	-8%	-23%	-7%	-3%	-5%	-14%	-10%	0%	-7%	-14%	-35%

The proposed action will adversely affect some visitors' use of the monument by requiring that some visitors shift the timing of their visits. The system will affect the visitation of approximately 215,000, or 21.5% of annual visitors that planned to drive to Muir Woods. These visitors, who principally visit on peak season weekends, are those who would be affected by needing to shift the date or time of their visit to find an available time. It is assumed that some of these visitors, approximately 75,000 in 2017, will be unable to find a time and need to

reschedule a visit to another less crowded time of year or forgo a visit. For this analysis, it is assumed they will chose to forgo a visit rather than shift to another season. This impact may diminish over time as public awareness of the reservation system increases, resulting in a natural shift in visitation patterns into off-peaks. Impacts may be further mitigated by increased availability of public transit during off season and shoulder seasons (Muir Woods Shuttle).

While the visitor experience may be enhanced under the Proposed Action, visitor use may be negatively impacted by the increased costs associated with implementing it. To start, it is estimated that the cost to visit Muir Woods will increase by approximately \$3 per visitor. This assumes that the cost to park a POV at the monument would be between \$8 and \$10 with an average POV occupancy of approximately 3.1.

Cumulative Impacts

Visitor Use will be affected by the construction of facilities in the project area, but these are expected to be minor and manageable. It is likely that construction activities will require periodic shifts in where parking occurs in the area as road shoulders and/or parking lots are reconstructed, however, it is expected that overall visitor use levels will be relatively unaffected. The proposed action (reservation system) would support the management of parking during construction within designated areas of Muir Woods Road or in NPS managed parking lots at Muir Woods. The reservation and parking management systems that are included in the proposed action would reduce impacts and allow the park to adaptively manage demand and visitation levels to ensure that impacts to visitor use and experience are kept to manageable levels.

Cost to visitors will be affected by the cumulative impacts of the entry fee being adjusted in 2016 and the cost of implementing the Proposed Action in 2017. The range of combined cost to visitors of these two actions above existing conditions is expected to approximately \$6.00. However, this increase in cost associated with visitor use, is considered a minor impact and can be mitigated through existing NPS programs that provide opportunities for lower-income visitors. Historically, visitation levels to Muir Woods have shown a resilience following fee increases, with visitation increasing steadily and consistently despite cost increases over the past 18 years.

Conclusion

Overall, the implementation of the Proposed Action would be beneficial for the visitor experience at Muir Woods, including the arrival and departure experience as well as the experience within the monument. The visitation profile defined above in **Figure 2** is consistent with the goal of compliance with GMP goals and standards. Several analytical approaches demonstrate a robust relationship between social conditions and daily visitor use levels and point to use levels at which social indicators and standards established in the GMP will most typically be reached. Simulations and regression analysis results suggest a maximum use level of 3,550 to 4,860 daily visitation to maintain the GMP indicators and standards, suggesting that 4,200 daily visitation is an appropriate initial maximum user capacity planning standard, subject to future monitoring and refinement, that will not be exceeded more than 10% of the time.

The visitation profile (figure 2) represents the maximum visitation level to which the NPS would manage operation of the reservation system. Managing to this level would ensure reasonable access to the public to experience the monument, while protecting resources and meeting other GMP goals and performance measures. It would ensure that visitors can have diverse experiences; would provide the highest visitation capacities whenever demand is highest (weekends between Memorial Day and Labor Day) and would achieve reduced visitation levels during off-peak seasons to provide quieter and less crowded experiences for reflection and contemplation among the majestic old-growth forest.

While the visitor experience may be enhanced under the Proposed Action, visitor use may be negatively impacted by the increased costs associated with implementing it. However, this increase in cost associated with visitor use, is considered a minor impact and can be mitigated through existing NPS programs that provide opportunities for lower-income visitors. Visitation levels to Muir Woods have shown a resilience following fee increases, with visitation increasing steadily and consistently despite cost increases over the past 18 years.

Transportation

Affected Environment

Because Muir Woods experiences very high visitation during peak periods, vehicle trips and parking demand substantially exceed parking supply on a recurring basis through the peak season and on weekends and holidays. This results in heavy traffic and congestion in the Muir Woods parking lots and on Muir Woods Road near the monument entrance during these times. In addition, roads leading to the monument experience substantial, recurring traffic and congestion during peak weekday commute periods and weekend recreational peak hours.

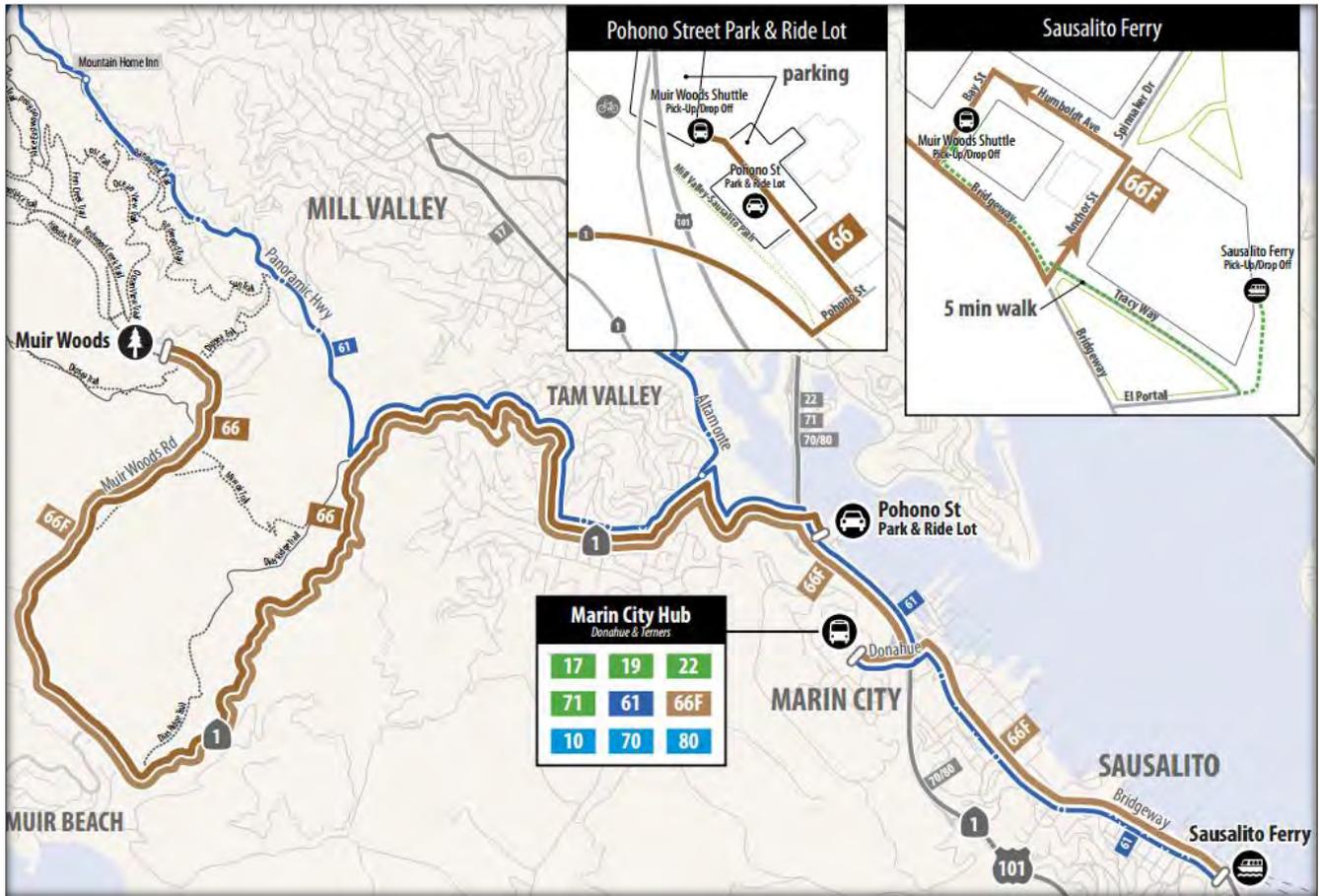
During these peak periods, parking routinely fills the Muir Woods parking lots by 9–10 am, with overflow parking then extending downstream on the shoulder of Lower Muir Woods Road (known locally as Franks Valley Road), as well as on Upper Muir Woods Road. Currently, 152 parking spaces exist for POVs in NPS lots within Muir Woods, including nine spaces compliant with the Americans with Disabilities Act and two spaces for electric vehicles. Parking along Lower Muir Woods Road, although informal, routinely extends over a mile from the monument entrance, with over 400 vehicles parking during peak-season weekends. This over-utilization of parking and traffic congestion create a number of transportation problems, including:

- Parking in illegal and unsafe areas.
- Visitors walking in unsafe areas, including in the travel lanes of Muir Woods Road.
- Congestion in the parking lots and pedestrian/vehicle conflicts, and adjacent roads, creating driver frustration and degraded visitor and local resident experiences.
- Congestion and long vehicle queues, impeding shuttle and tour buses and reducing the effectiveness of public transit and other transportation services.

There are 16 parking spaces for public transit and commercial tour operators; 10 are sized for larger buses (up to 35 feet), and six are for smaller mini-buses and vans. These spaces are also over-utilized during peak periods, with commercial tour operators overflowing into POV spaces during those times.

Public transportation to Muir Woods is via the Muir Woods Shuttle (Marin Transit Routes 66/66F), which picks up passengers from two locations in Sausalito. Routes are shown in **Figure 5** below. The current operational schedule for Route 66 is weekends and holidays between April and October, as well as Thanksgiving weekend, Christmas week, and Martin Luther King Jr. weekend). Route 66F currently operates weekends and holidays between April and October and weekdays between late June and late August.

Figure 5. Routes for Marin Transit Routes 66 and 66F (Marin Transit 2015)



GMP Goals and Strategies

The relevant transportation goals and management strategies of the GMP are described below (Vol 1, Page 104-106).

Transportation Goals

- Reduce greenhouse gas emissions.
- Create enjoyable and welcoming transportation experiences for all visitors.
- Preserve and protect park resources by minimizing transportation impacts.
- Create equitable and convenient multimodal transportation options to and within the park.
- Inspire environmental consciousness by demonstrating environmental excellence in transportation.

Management Strategies

Employ Tools for Congestion Management

Congestion management or transportation demand management is a collection of management tools focused on shifting personal travel patterns to off-peak periods, to more efficient modes (such as public transit and ridesharing), and to alternative modes (such as cycling and walking) in order to offset vehicle congestion, particularly during peak periods. Tools could include improving and promoting transit options,

implementing a reservation system, shifting employee work hours, and employing congestion fees (such as parking fees).

Expand the Muir Woods Shuttle

The park staff would continue to collaborate with Marin Transit to improve and expand the Muir Woods shuttle service, including increased operating hours and shuttle frequency.

Employ Intelligent Transportation Systems

Intelligent transportation systems use technology to improve transportation efficiency. Such systems include electronic highway message signs with up-to-date travel information and electronic bus stop signs with up-to-the-minute information about bus arrivals. These tools help travelers plan their trip and often help travelers choose alternative routes or modes to avoid congestion. As a result, the total distribution of travelers is spread more evenly across the system and the system functions more efficiently. Park managers would continue to work with Caltrans and other agencies to employ tools to support the Muir Woods shuttle service and other alternative transportation access to park sites.

Improve Mobility, Access, Connectivity, and Collaboration

Mobility, access, and connectivity form the keystone of the monument's multimodal transportation system. Although cars will continue to be an important part of the transportation system, park staff is committed to reducing dependence on automobiles by increasing the efficiency of other modes of travel. Creating practical transportation options and educating the public of their viability and desirability will increase use of modes other than cars. Park staff will continue to collaborate with regional partners to achieve the vision of creating a seamless multimodal transportation system to access the park for residents and visitors in the Bay Area. This collaboration extends to applying universal design principles, which provide access for people with disabilities.

Impacts of Alternative A – No Action

Adverse: Alternative A would result in the level and patterns of traffic and vehicle trips increasing at a rate very close to the expected 1% per year increase in visitation. This would exacerbate the existing transportation problems identified above in the description of the Affected Environment.

Cumulative Impacts

Under Alternative A, cumulative impacts to transportation will be affected by construction of facilities in the project area. These impacts would likely last through the entire period of construction (~5 months per year 2018-2021) and the intensity of the impacts would be serious. Without the ability to manage vehicle trips into the construction zones, areas that are currently very congested will be even more so. This could lead to extensive delays, driver/visitor frustration, safety problems, creation of new social trails, resource impacts, and delays and added costs to construction operations.

Impacts of Alternative B – Proposed Action/Preferred Alternative (Environmentally Preferable Alternative)

Transportation-related adverse impacts would be reduced. Daily vehicle trips and peak-hour vehicle trips would be reduced substantially, particularly during peak season. Parking would be reduced by approximately 40-45% below existing conditions, and would result in the elimination of parking on Muir Woods Road outside the Muir Woods boundaries over the course of seven years.

Vehicle Trips

The Proposed Action would reduce vehicle trips and parking supply in and near Muir Woods. By requiring a reservation for motorized access, the NPS would have the ability to manage vehicle arrivals to a level that can be

accommodated with available parking supply while meeting visitor experience and other GMP performance targets.

Figure 6 compares the estimated daily and peak-period trips under the Preferred and the No Action Alternatives. The reservation system would reduce daily trips (defined in this EA as those vehicle trips destined to Muir Woods during the hours of 9 am–6 pm, which are the proposed hours of operation for the system) due to the ability of the system to cap the number of vehicles that are provided reservations for a given day. It reduces peak-hour trips (defined as weekends from 11 am–1 pm) through a combination of reducing the number of daily trips and more evenly distributing those reduced number of trips over a larger part of the day.

Figure 6. Estimated Personal Occupancy Vehicle Trips Under Preferred Alternative and No Action Alternative

POV Trips		January	February	March	April	May	June	July	August	September	October	November	December
Weekend Daily Trips													
No Action		527	639	774	1053	974	1017	1319	1203	918	929	601	588
Preferred Alt		519	524	526	812	891	891	891	891	891	747	508	511
% Change		-2%	-18%	-32%	-23%	-9%	-12%	-32%	-26%	-3%	-20%	-16%	-13%
Weekend Peak-hour Trips													
No Action		75	91	110	149	138	144	187	171	130	132	85	84
Preferred Alt		60	60	60	93	103	103	103	103	103	86	58	59
% Change		-20%	-34%	-45%	-38%	-26%	-29%	-45%	-40%	-21%	-35%	-32%	-30%

Public Transportation

The Proposed Action would increase public transportation to Muir Woods through the expansion of service days by the Muir Woods Shuttle (Marin Transit Routes 66/66F). Expansions would occur to Route 66 by expanding incrementally from the current operational schedule (weekends and holidays between April and October, as well as Thanksgiving weekend, Christmas week, and Martin Luther King Jr. weekend) to weekends and holidays year round. In addition, Route 66F is proposed to continue the expansion scheduled to be implemented by Marin Transit in 2015, which includes weekends and holidays between April and October and weekdays between late June and late August. (See **Figure 5** for existing and planned service of Routes 66 and 66F.) **Figure 7** shows estimated monthly one-way trips of the shuttle under the Preferred Alternative and the No Action Alternative.

Figure 7. Estimated Muir Woods Shuttle Trips under the Preferred Alternative and the No Action Alternative

MUWO Shuttle Trips		January	February	March	April	May	June	July	August	September	October	November	December
Monthly Trips (one-way)													
No Action		160	0	0	600	600	613	1020	1000	533	400	213	373
Preferred Alt		533	427	427	480	600	613	1020	1000	533	533	427	480

The Proposed Action would align with GMP transportation goals and management strategies by substantially reducing the transportation impacts associated with visitation to Muir Woods. It would reduce daily trips during peak days, and it would reduce peak hour trips throughout the year. The ability to manage vehicle trips would substantially improve traffic and congestion in the Muir Woods parking lots and on Muir Woods Road, as well as reduce the number of trips bound for Muir Woods through congested approaches to the monument, including Tam Junction and Shoreline Highway. The management of vehicle trips and arrival times would also allow reduction of vehicle parking supply, which would reduce parking farthest from the monument over time, with parking on the road downstream of the Redwood Creek Bridge phased out over a period of seven years. This would improve conditions for pedestrians, as visitors who currently must park on Muir Woods Road often must walk over two miles round-trip between their vehicles and the entrance.

Cumulative Impacts

Transportation will be affected by the construction of facilities in the project area. It is likely that construction activities will require shifts in where parking occurs between the various areas as road shoulders and/or parking lots are reconstructed. However, it is expected that overall transportation demand and services will be relatively unaffected by construction activities, as parking and other access will be relocated to other areas. The proposed action (reservation system) would support management of transportation and access within designated areas of Muir Woods Road or NPS managed parking lots at Muir Woods. The reservation system and parking management tools that are included in the proposed action would reduce impacts and allow the park to adaptively manage demand and visitation levels to ensure that impacts to transportation are kept to manageable levels.

Conclusion

The Proposed Action would be consistent with the transportation goals of the GMP and would reduce impacts associated with transportation to the monument. It would reduce peak-hour visitation by as much as 45% (on average) during peak period weekends when visitation is at its highest, and by approximately 20% (on average) during off-peak season weekends. Similarly, daily vehicle trips would be reduced by as much as 32% in July, when visitation is at its highest, and by approximately 2% in January. These reductions in vehicle trips would mitigate impacts at the monument, on local and state highway approaches, on the operations of shuttles, and on conflicts between pedestrians and bicycles.

The proposed action may result in some visitors who are affected by the reservation system to use other parks or recreational destinations, including those in the same general vicinity of Muir Woods (i.e. Muir Beach, Mt. Tam State Park, etc.). The levels and impact of this potential is expected to be negligible.

Consultation and Coordination

Internal Scoping

Internal scoping associated with the Proposed Action has been extensive. This has included dozens of internal interdisciplinary team meetings and review, including Project Review, Project Management Group, Leadership Team, inter-divisional meetings and with NPS' Pacific West Regional Office.

External Scoping

External Scoping has been extensive for the Proposed Action. The following is a list of scoping meetings and scoping activities that the NPS has conducted since the start of external scoping on September 18, 2013.

Scoping has included dozens of meetings with the public, with local and state agencies, and with local, state, and national interest groups, including:

Public Meetings

- September 18, 2013 – Tam Valley Elementary School
- June 18, 2014 – Tamalpais Valley Community Center
- May 26, 2015 – Mill Valley Community Center

Local, State, and Federal Agencies

- County of Marin
- Marin Transit
- California Department of Parks and Recreation
- City of Mill Valley
- City of Sausalito
- Tennessee Valley Community Services District
- Muir Beach Community Services District
- National Oceanic and Atmospheric Association - National Marine Fisheries
- US Fish and Wildlife
- Regional Water Quality Control Board

Local, State, and Federal Interest Groups

- Marin Conservation League
- Marin Audubon
- Marin watershed Alliance
- Sierra Club – Bay Area Region
- Mount Tam Task Force
- Muir Woods Community Association
- Tam Valley Conservation

As a part of the scoping process for the reservation system, which began in September 2013, the NPS considered comments from the public and stakeholders. The comments submitted in writing during the open comment period between September 18, 2013, through January 11, 2014, showed that public support for implementing a reservation system was strong, with over 60 commenters expressing support for the system and only five expressing opposition. In addition to written comments, the NPS has received a large volume of comments at meetings with community stakeholder groups. The most common themes of these comments included:

- Desire to see established visitation levels based on the “carrying capacity” of Muir Woods. There was also a common desire to ensure that there be continued periods of the year when visitation is lower to ensure quiet times and access by local residents, who tend to avoid the area during peak periods.
- Support for increasing the use of shuttles.
- Concern over commercial tour management.
- Concern over fees and costs.
- Concern over use of the county road and potential impacts to Redwood Creek’s habitat.

In order to discuss public comments received during the scoping and to form a common understanding of the critical issues, a series of meetings was organized by Congressman Jared Huffman. The congressman's meetings were attended by an ad-hoc committee that included:

- Congressman Jared Huffman
- National Park Service
- County of Marin
- Marin Transit
- California Department of Parks and Recreation
- City of Mill Valley
- Mount Tam Task Force
- Marin Conservation League
- Muir Woods Community Association
- Golden Gate National Parks Conservancy
- Tennessee Valley Community Services District

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List of Acronyms

CDPR	California Department of Parks and Recreation
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CMS	changeable message signs
EA	Environmental Assessment
GGNRA	Golden Gate National Recreation Area
GMP	General Management Plan
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
PAOT	people at one time
POV	personal occupancy vehicle
PPV	people per view
SR	State Route
VERP	visitor experience and resource protection

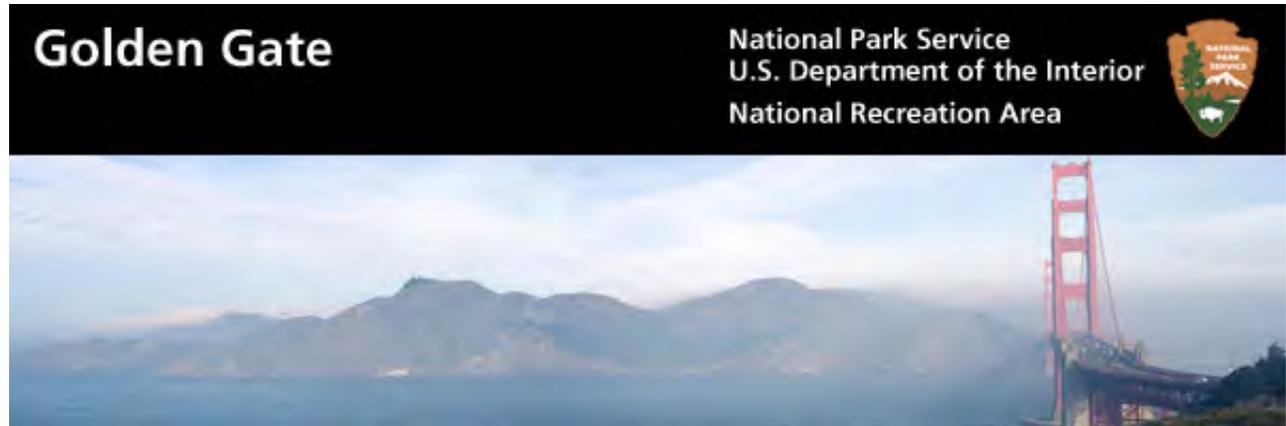
Appendix A

Public Notices – September 17, 2013 and June 18, 2014 Public Meetings

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Internships are offered in restoration ecology, inventory and monitoring, education and outreach, trail work, and more. Interns earn a weekly stipend, receive personalized training, and gain marketable work experience. Internships are competitive and generally one year positions. You will work hard but have lots of fun! Check out the listings on the [NPS](#) and

Planning for Improved Visitor Access at Muir Woods Now Accepting Public Comments

Dear Park Friend,

Golden Gate National Recreation Area, in cooperation with Mount Tamalpais State Park and the County of Marin, invites the public to help develop options for better managing visitor demand and congestion at Muir Woods National Monument. The three organizations are asking the public to be involved in the planning process for two separate projects, and will hold public meetings (see below for more information) to solicit input on a range of possible operational and physical improvements, and the issues and concerns that should be addressed in the plans and environmental compliance documents that will be prepared.



Vehicle congestion at Muir Woods

The Issue

Muir Woods National Monument, adjacent parts of Mount Tamalpais State Park and Marin County roadways experience substantial traffic and parking congestion during periods of peak visitation. The congestion, combined with gaps in the park's trail and pedestrian circulation systems, routinely result in visitors parking on the unimproved road shoulder along Muir Woods Road some distance from the park entry and walking on the narrow busy road. These conditions contribute to pedestrian safety concerns and negative visitor experience at the entry area of the monument. Muir Woods also has aging and undersized visitor support facilities, including parking lots, restrooms, and trails near the entrance that are in need of improvement.

The following two projects are being proposed to address these issues:

Muir Woods Parking Reservation and Shuttle System

This project focuses on operational improvements; namely a reservation system for parking with an expanded inter-park shuttle service. The reservation system is necessary to allow the park to better manage visitation and reduce congestion and related impacts.

Muir Woods Transportation & Access Site Improvements

This project would include physical changes to the entrance areas at Muir Woods and nearby Mount Tamalpais State Park such as replacement of facilities, improvement to trails and pedestrian paths, and limited new construction of parking areas and other facilities mostly in previously disturbed areas.

These two independent planning processes are related, but are considered separate actions. Both projects are meant to address longstanding transportation and access challenges at Muir Woods. However, they differ in their planning and implementation schedules, and potential environmental impacts.

Public Meetings

To solicit comments on these two projects in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), and Section 106 of the National Historic Preservation Act, the public is invited to attend a public meeting:

Public Scoping Meeting
Wednesday, September 18, 2013
6:30 - 8:30 P.M.
Tam Valley Elementary School; Multi-Purpose Room
350 Bell Lane; Mill Valley, CA 94941

A second public meeting will be held on Wednesday,

November 20, also at Tam Valley Elementary School. At this second meeting, the project team will summarize the comments received during the scoping period, update participants on plans for the parking reservation system, and present a range of alternatives for site improvements at Muir Woods. Participants will be invited to discuss and refine the concept alternatives in a workshop format. Another message will be sent in regards to this meeting as the date approaches.

Submitting Comments

Scoping comments will be accepted through October 4, 2013, and can be submitted in the following ways:

- In person at the September 18 public meeting,
- Online at: <http://parkplanning.nps.gov/goga> [Projects are listed alphabetically],
- Or by mail to:

Golden Gate National Recreation Area
Attn: Muir Woods Transportation Projects
Building 201, Fort Mason
San Francisco, CA 94123

In order to help us manage the comments for each project separately, we ask that you please clearly identify which project you are commenting on within your written comments. All correspondence will be shared with the planning teams for both projects.

Thank you for participating in this important planning process.



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National Trails Day



Celebrate National Trails Day on June 7, 2014 in the Golden Gate National Parks! The Trails Forever Team, and our partner organizations will host a series of trail projects throughout the park (in Marin, San Mateo, and San Francisco).

Help enhance the trail system, meet fellow park lovers, and enjoy a celebration of your great park!

Free Reservations for each location required.

For event details, click

SAVE THE DATE! For a Public Meeting Muir Woods Reservation System for Parking & Shuttles

Dear Park Friend,

The National Park Service invites you to a public meeting about a proposed reservation system for parking and shuttles to manage traffic congestion and visitation at Muir Woods. This meeting follows an initial public scoping meeting held on September 18, 2013 at the Tam Valley Elementary School. Representatives from the County of Marin and California State Parks plan to attend and participate in the meeting.

Meeting Details:
6:30 to 8:30 P.M. - Wednesday, June 18, 2014
Tam Valley Community Center
203 Marin Avenue
Mill Valley, CA 94941

The concept for a parking lot on Panoramic Highway at Homestead Hill has been eliminated from further consideration.

More information will be available on the project website before the meeting:
http://parkplanning.nps.gov/muwo_access

For now, we are asking you to please save the date on your calendar. Thank you.

here.



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Appendix B

Draft Memorandum of Understanding, County and Marin and GGNRA

MEMORANDUM OF UNDERSTANDING
Between
NATIONAL PARK SERVICE
and
COUNTY OF MARIN

THIS MEMORANDUM OF UNDERSTANDING (“MOU”) is made and entered into this ____ day of _____, 2015, by and between the COUNTY OF MARIN (“County”), and the NATIONAL PARK SERVICE (“NPS”). County and NPS may hereinafter be referred to as a “Party,” or collectively, the “Parties.”

ARTICLE I –BACKGROUND

Visitation to Muir Woods National Monument (Muir Woods) has steadily increased, especially at peak periods, overwhelming the current transportation infrastructure that serves it, including Muir Woods Road (aka Franks Valley Road). During peak visitation periods, problematic conditions can exist along Muir Woods Road, including experiencing over 400 vehicles parked along the Muir Woods Road shoulder. Although there is a portion of Muir Woods Road that contains viable and reasonably safe roadside parking, much of the road being used as Muir Woods overflow parking is not suitable, resulting in unsafe conditions and/or actual or potential damage to natural resources.

The NPS, in consultation with California Department of Parks and Recreation (CDPR) and County, has conducted a variety of studies and expert analyses, and has proposed a feasible approach to these issues using a vehicle parking reservation system. The Parties have a common responsibility and desire to cooperatively implement a parking reservation, public transit and enforcement program that will substantially improve these conditions.

This agreement does not presume or supersede any regulatory, compliance, and/or permitting requirements for individual actions herein. Actions that are subject to regulatory or permitting requirements will fulfill these requirements prior to implementation.

ARTICLE II- GOALS

The Parties enter into this MOU with the following goals:

1. To protect, preserve and enhance the health of Redwood Creek watershed, including its salmonids.
2. To reduce traffic congestion at Muir Woods, on Muir Woods Road and in the local communities adjacent to and leading to Muir Woods.
3. To improve traffic and pedestrian safety and reduce environmental impacts that may arise from parking along Muir Woods Road.
4. To increase local transit and better manage buses, both commercial buses and public transit.

While the actions outlined in this MOU will take place over a number of years and some improvements will be gradual, the County and NPS are committed to meeting milestones, making steady progress on common goals, and reporting publicly on that progress, including parking enforcement, to all interested stakeholders.

ARTICLE III- OBJECTIVES

The Parties have agreed on the following action objectives:

- A. To identify a Parking Management Corridor, as shown on Attachment A to this MOU, where the Parties will manage parking along Muir Woods Road as set forth in this MOU.

- B. To identify a Parking Enforcement Corridor, as shown on Attachment A to this MOU, where the Parties will undertake parking enforcement along Muir Woods Road as set forth in this MOU.
- C. To implement a reservation system for visitors using motorized transportation modes within approximately two years of the execution of this MOU.
- D. To eliminate all shoulder parking along Muir Woods Road downstream of the Redwood Creek Bridge (the "Bridge") near Muir Woods entrance within five years of implementing the reservation system.
- E. To initially restrict parking on Muir Woods Road downstream of the Bridge to no more than 80 spaces during peak periods and make best efforts to reduce parking to 50 spaces during non-peak periods (October 1 through April 30), until the reservation system is operational, but no later than June 1, 2016, after which time further reductions, leading to the elimination of such parking, will occur as specified in this MOU.
- F. To maintain approximately 30 spaces along the road upstream of the bridge for parking or vehicle queuing, not including buses.
- G. To commence a process to upgrade and expand parking facilities on NPS property to reduce environmental impacts from current facilities and to relocate some of the parking currently downstream of the bridge.
- H. To work together to improve water quality and environmental conditions for Redwood Creek and its fisheries.
- I. To communicate about individual environmental compliance requirements within their responsibility, where applicable, including the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA).
- J. To jointly work to expand public transit to Muir Woods utilizing Marin Transit's Muir Woods Shuttle.
- K. To improve joint management and enforcement of traffic and parking laws to improve safety and protect resources.
- L. To communicate and collaborate with CDPR on matters related to this MOU.

ARTICLE IV - ACTIONS

- A. Upon execution of this MOU, and prior to the start of the reservation system, the Parties will take the actions listed below:
 - 1. Both Parties agree to:
 - a. Reduce parking on Muir Woods Road downstream of the Bridge to no more than 80 vehicles during peak periods as soon as it can be practically achieved, but no later than June 1, 2016.
 - b. Jointly identify parking restriction measures, such as signs, bollards, and fencing that will be implemented incrementally throughout the Parking Enforcement Corridor, as shown on Attachment A. Implementation responsibilities are defined below.
 - c. Undertake interim storm water management measures to reduce potential impacts from roadside parking on Redwood Creek (Attachment C).
 - d. Maintain access to Mt. Tamalpais State Park trailheads, such as Deer Park Fire Road, for State Park users.
 - e. Hold and participate in a public County Board of Supervisors meeting at least once a year, and a community meeting held in Southern Marin, once a year, to discuss progress on implementation

of this MOU and be available for questions and receive public input, and which meetings shall be noticed no less than 30 days in advance.

- f. To acknowledge that by providing the NPS with the authority necessary to enforce traffic and parking regulations throughout the Parking Enforcement Corridor, the Sheriff does not relinquish or reduce any of its existing authority to perform these functions during the entire term of the MOU.

2. The NPS agrees to:

- a. Provide funding for materials needed to install parking restriction measures.
- b. Develop a reservation system for managing motorized access and parking at Muir Woods, including within the Parking Management Corridor, subject to compliance with environmental and other applicable laws.
- c. Continue to partner with Marin Transit to provide public transit service to Muir Woods, subject to the completion of an additional agreement for negotiated sharing of costs of operating the Muir Woods Shuttle and coordination on shuttle fares.
- d. Commence parking management and enforcement utilizing a portion of existing staff time on Muir Woods Road upon receipt of authority from County of Marin Sheriff.
- e. Provide additional NPS Law Enforcement Ranger capacity (equivalent to 1 full time person) for parking enforcement and management within Muir Woods National Monument and along the Parking Enforcement Corridor and assume primary responsibility for parking management and enforcement along that corridor beginning no later than January 1, 2016.
- f. Provide all bus and tour company licensees, and all other carriers providing visitation transportation to Muir Woods with a copy of the County of Marin's ordinance regulating bus size and road access.
- g. Undertake or coordinate with CDPR to undertake interim storm water management measures within the Parking Management Corridor (subject to obtaining the required permission from the County of Marin).
- h. Coordinate with CDPR to ensure annual non-toxic vegetation management for safety purposes within the right-of-way in areas where physical barriers prevent efficient access by County Road Maintenance staff.

3. The County agrees to:

- a. Approve implementation of parking restriction measures, including issuing NPS and/or CDPR, or their contractors, the necessary encroachment permits, subject to any necessary compliance actions, and to assist NPS and/or CDPR with implementation.
- b. Issue NPS and/or CDPR, or its agents, an encroachment permit to install interim storm water measures within the County right of way.
- c. Adopt a County Ordinance that prohibits or restricts the stopping, parking or standing of vehicles and provides preferential parking privileges to NPS under which NPS may issue permit or permits, and which allows NPS, through its contractors, to charge and retain a reservation fee for parking permits. Such Ordinance shall be limited on Muir Woods Road to the Parking Management Corridor (identified in Attachment A).

- d. In collaboration with NPS' own enforcement efforts, the Sheriff's Office will maintain primary enforcement responsibility for parking along the Parking Enforcement Corridor until NPS assumes that primary responsibility on January 1, 2016.
- e. Subject to approval of the Sheriff, provide the NPS with the explicit authority necessary to enforce traffic and parking regulations throughout the Parking Enforcement Corridor.
- f. Install no parking signs and continue to explore feasibility of tow away zones.

B. For a 5 year period beginning upon initiation of the NPS's parking reservation system, the Parties agree to the following:

- 1. The Parties agree to:
 - a. Hold and participate in a public County Board of Supervisors meeting at least once a year, and to hold a community meeting at least once a year, to discuss progress on implementation of this MOU, and be available for questions and receive input from the public.
 - b. To continue to collaborate and undertake projects that improve habitat conditions for salmon and other species in the Redwood Creek corridor.
- 2. The County agrees to:
 - a. Issue any permits to the NPS to perform routine day-to-day operational responsibilities within the Parking Management Corridor.
 - b. Through the preferred parking authorization, limit Muir Woods-related parking downstream of the bridge on Muir Woods Road to no more than 80 vehicles for the first 2.5 years of the reservation system operation, but no later than June 1, 2016, then to no more than 40 vehicles between years 2.5 and 5 years of reservation system operation, and then to 0 (zero) vehicles after 5 years of reservation system operation.
 - c. The exception to the limits described above is that during periods of construction on projects within the Muir Woods area that displaces vehicles parked elsewhere in the watershed, up to 80 vehicles may be parked downstream of the bridge.
 - d. Provide the NPS with the explicit authority necessary for it, through its contractors, to manage the reserved parking within the Parking Management Corridor.
 - e. Continue to conduct all non-routine maintenance actions for the entirety of Muir Woods/Frank Valley Road, such as the repair or stabilization of the alignment required due to land movement and landslides, and the long term maintenance program associated with the road, including the maintenance, replacement, and/or renewal of asphalt road surface, drainage structures, and road sub-surface, subject to available funding for such actions.
- 3. The NPS agrees to:
 - a. Operate a parking reservation system, through a contractor, to the extent consistent with the NPS's compliance actions, for all motorized arrivals to Muir Woods, in the following manner:

- i. Require reserved permit parking in the area defined in the Parking Management Corridor and in the NPS Muir Woods parking lots in accordance with section IV. B.2 above.
 - ii. Collect reservation/permit fees from Muir Woods visitors to support the system's operation and other obligations in this Agreement.
 - iii. Manage the reservation system resulting in visitation levels that are at or below those identified as "Total Capacity – This Alternative" in Attachment B.
 - iv. Prohibit bus parking along Muir Woods Road and require tour bus operators to secure a reservation.
 - v. Manage changeable message signs (CMS) along Highway 101 and other State or local roads to support the reservation system.
 - vi. Provide information on its website and public service announcements to inform visitors of the need to secure a reservation.
- b. Assume routine day-to-day operational responsibilities within the Parking Management Corridor, which includes, but is not limited to, parking management, non-toxic vegetation management, litter collection, and routine maintenance (surface treatment) of shoulder and pedestrian areas.
- c. Upon commencement of the reservation system, provide one additional NPS Law Enforcement Ranger capacity (equivalent to 1 full time person, for a total of 2 full time employees) for routine day to day operational responsibilities for parking enforcement and management within Muir Woods National Monument and along the Parking Enforcement Corridor.
- d. Require all contractors working for NPS to provide the necessary insurance certificates and endorsements naming the County as additional insured. Also, NPS will require all contractors/concessionaires working within the Muir Woods Road county right of way to indemnify, defend and hold the County, its officers, agents and employees harmless from any and all claims, suits or liability, including, but not limited to, litigation costs and attorney's fees which the County may incur as the result of any and all claims and suits for personal injury, property damage or inverse condemnation related to the contractors'/concessionaires' contract work.

ARTICLE V-TERM, DISPUTE RESOLUTION, AND TERMINATION

The initial term of this MOU shall remain in effect for a period not to exceed seven (7) years from the fully executed MOU date unless prior thereto it is terminated. The Parties will confer at the conclusion of the initial term and review the outcomes and objectives. The Parties may, upon mutual agreement in writing, renew the MOU and agree on any amendments, attaching such amendments to this MOU. However, prior to any amendment to or renewal of this MOU, such amendments or renewal must be presented to the public in one of the annual meetings required under Article IV of this MOU. In addition, any amendments must be presented in writing as part of the public noticing required by Article IV of this MOU for the annual meetings.

If either Party identifies a material failure of the terms and conditions of this agreement which results in a dispute, they may notify the other Party in writing. The Parties will follow-up with meetings and communications to resolve the dispute over the course of 90 days with the goal to mutually agree on a timeframe and approach

to remedy the failure, depending on the gravity of the failure. If the Parties cannot resolve the dispute within the 90 days, the parties shall mutually agree to mediate the dispute over the course of the following 90 days.

Following the above process, and if the dispute is not resolved, either Party may provide 180 day notice to terminate the MOU for cause.

ARTICLE VI-EXPENDITURE OF FUNDS AND RESOURCES

Nothing in this MOU shall be construed as obligating NPS or County to expend any funds in excess of appropriations authorized by law. The commitment of funds in furtherance of this agreement shall be subject to each PARTY'S budgeting procedure and separate agreement.

ARTICLE VII-GENERAL AND SPECIAL PROVISIONS

A. Non-Discrimination

All activities pursuant this MOU shall be in compliance with the requirement of Executive Order 11246; Title VI of the *Civil Rights Act of 1964*, as amended, (78 Stat. 252; 42 U.S.C. §§2000d et seq.); Title V, Section 504 of the *Rehabilitation Act of 1973*, as amended, *87 Stat. 394; 29 U.S.C. §794); the *Age Discrimination Act of 1975* (89 Stat. 728; 42 U.S.C. §§6101 et seq.); and with all other federal laws and regulations prohibiting discrimination on grounds of race, color, sexual orientation, national origin, disabilities, religion, age, or sex.

B. Lobbying Prohibition

18 U.S.C. § 1913, Lobbying with Appropriated Moneys – No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers or employees of the United States or of its department or agencies from communicating to Members of congress on the request of any Member or to Congress, through the proper official channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business.

C. Anti-Deficiency Act

31 U.S.C. §1341- Nothing contained in this MOU shall be construed as binding the NPS to expend in any one fiscal year any sum in excess of appropriations made by Congress for the purposes of this Agreement for that fiscal year, or other obligation for the further expenditure of money in excess of such appropriations.

D. Liability

1. Each Party accepts responsibility for any property damage, injury or death that occurs in connection with its implementation of this Agreement to the extent that such damage, injury or death is caused by its own negligent acts or omissions, or willful misconduct, or the negligent acts, omissions, or willful misconduct of its officers, employees and/or agents acting within the scope of their employment, agency or official capacity, to the fullest extent permitted by law.
2. Each Party agrees to cooperate in the investigation of any claims that may be filed with any other Party arising out of or in any way connected to activities authorized pursuant to this Agreement. In particular, the NPS agrees to cooperate, to the extent allowed by law, in the submission of claims pursuant to the Federal Tort Claims Act against the United States for personal injuries or property damage resulting from the negligent or wrongful act or omission of any employee of the United States while acting within the scope of his/her employment, arising out of this Agreement.

3. Except as expressly provided for herein, nothing in this Agreement shall be construed as creating joint liability with regard to any of the activities undertaken in implementation of this Agreement. Nothing in this Agreement shall be construed as giving any of the Parties the right or ability to bind the others or create any joint liability with regard to, or as a result of, the activities undertaken to implement this Agreement.
4. All employees or agents of a Party shall remain employees or agents of that Party and shall be subject to the laws, procedures, rules and policies governing that Party's employees and/or agents.

ARTICLE VIII-AUTHORIZED SIGNATURES

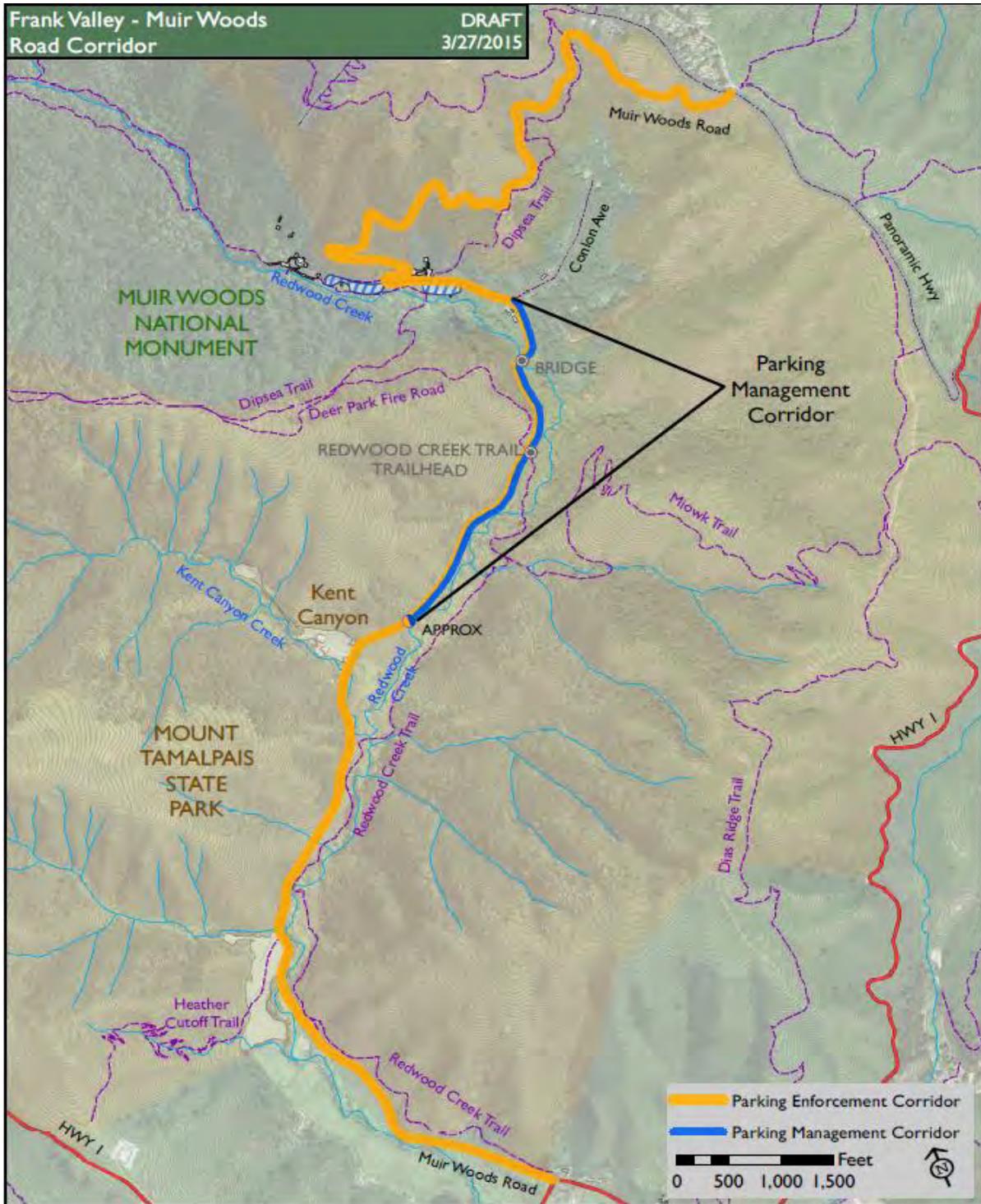
IN WITNESS HEREOF, the Parties hereto have signed their names and executed this agreement.

_____ Date _____
Chris Lehnertz
General Superintendent
Golden Gate National Recreation Area

_____ Date _____
Katie Rice
President of the Board
County of Marin

ATTACHMENT A

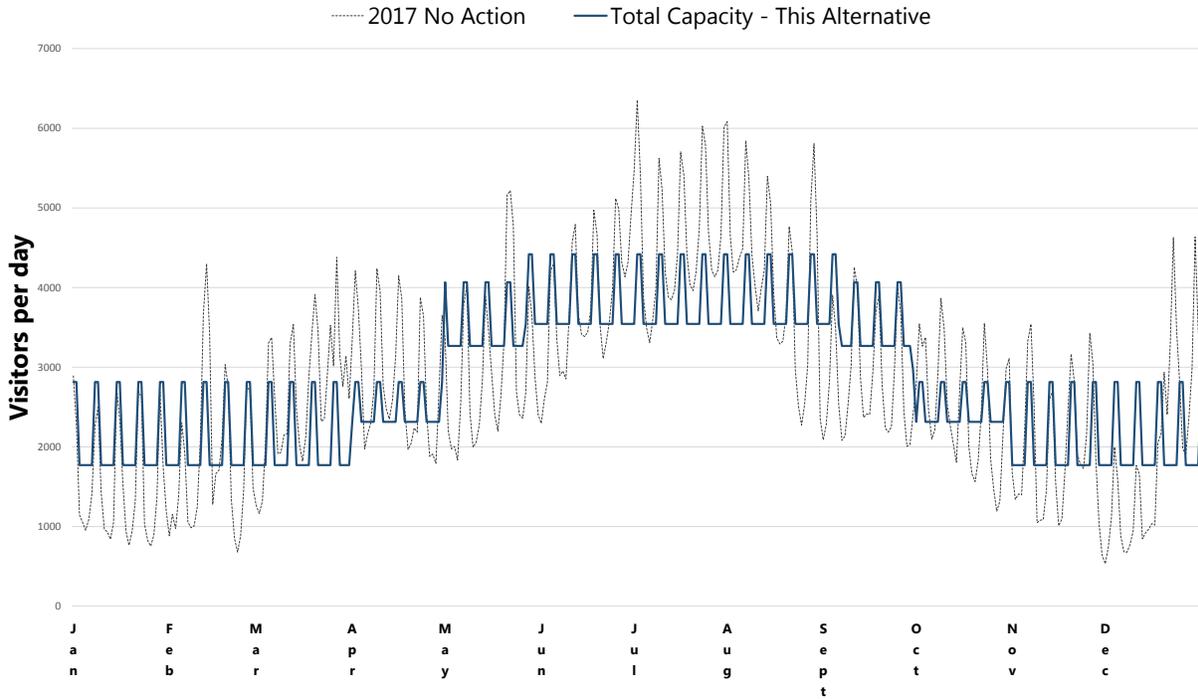
Parking Management Corridor for Muir Woods National Monument



ATTACHMENT B

Daily Visitation Goals for Muir Woods National Monument

Daily Visitation



Appendix C

Golden Gate National Recreation Area General Management
Plan/Environmental Impact Statement - Chapter 7, *User Capacity*

MUIR WOODS NATIONAL MONUMENT

Similarly to Golden Gate National Recreation Area, the management zones provide the most important implementation commitment for user capacity for Muir Woods National Monument because they describe the desired resource conditions and visitor experience (including appropriate types and levels of use, visitor services, and development) for all sites within the monument. These zones are consistent with and help achieve the monument's purpose, significance, and special mandates. Further, there are many existing visitor use management strategies already in use that would continue to be implemented to help the park staff achieve these desired conditions. Examples of some of these existing management strategies include:

- § visitor education on low-impact practices (e.g., quiet zones and quiet days)
- § management of visitor access (e.g., dedicated park shuttle access during peak season)
- § closure of sensitive resource areas (e.g., no recreational fishing or swimming in Redwood Creek)
- § regulations for visitor activities (e.g., hiking restricted to on-trail travel on the main trail through the woods)
- § permit requirements (e.g., all special events require a special use permit)

In addition to implementation commitments for the desired conditions, the park staff has selected user capacity indicators and standards for Muir Woods National Monument. The park staff considered many potential resource and social indicators that would represent visitor use influences on resource and social conditions within the monument. Similarly to Alcatraz Island, the indicators selected for inclusion in the

general management plan were those that were considered to be the most important, as well as feasible, for long-term evaluation.

PRIORITY RESOURCE INDICATORS

The priority resource indicators for Muir Woods National Monument are associated with the issues of informal trails (i.e., trails created by visitors leaving designated trails), impacts on soundscapes from human-caused noise, evidence of visitor-caused wear or disturbance to the redwood trees, and the amount and distribution of invasive species.

The proliferation of informal trails in Muir Woods National Monument is not currently a serious problem because the NPS staff has greatly increased efforts to clearly delineate designated trails and to educate visitors to stay on trails. Although conditions have improved and informal trails are not a significant concern currently, any future expansion of informal trails was still considered a high priority issue given the related impacts of vegetation loss; soil erosion; fragmentation of wildlife habitats; and disturbance to rare flora, fauna, and archeological sites (Marion 2008). The indicator for informal trails is based on a modified version of a trail condition classification system developed by Jeff Marion of the U.S. Geological Survey (Marion 2008). Given the associated resource concerns and limited extent of informal trails currently, the standard was set at zero tolerance for new informal trails in order to perpetuate existing conditions over the long term. As mentioned, some management activities the National Park Service has been employing in relation to this issue include educating visitors to stay on trails and clearly marking designated trails. Further, the National Park Service has placed barriers and actively restored informal trails to minimize

continued use. Roving patrols and other education and enforcement techniques have also been used.

Given the high levels of use in the woods, including use by families and groups, noise levels and the frequency of human-introduced sound can affect the natural soundscape, disrupting wildlife and impacting visitor experience. These changes can sometimes influence normal wildlife activities, leading to altered behavior and productivity in individuals and possible modifications in the abundance and distribution of populations (Knight and Gutzwiller 1995). Baseline conditions for monument soundscapes were established through comprehensive noise monitoring in 2006 and 2007. These data, along with visitor surveys, were used to identify the best metrics for soundscape indicators and establish associated standards. There is more discussion below on the studies conducted and how they were used in the planning process. Some of the management activities the National Park Service has been employing in relation to this issue have focused on education regarding low-impact practices, including introducing “quiet days” and “quiet zones” within the woods to encourage visitors to voluntarily modify their behavior and better protect the natural soundscape.

Although visitor use is not the only or even the primary source of invasive species, these species can be introduced and spread through visitor and vehicle activity within the monument. The NPS Inventory and Monitoring program has been monitoring the number of detections and the extent of cover of invasive species as part of the Vital Signs Program. The goal of the program is to target new or expanding infestations (NPS 2006a). The indicators and standards included in table 29 are consistent with those being pursued by the NPS Inventory and Monitoring program. If monitoring detects a change in the number or extent of invasive species, then a problem analysis would be needed to isolate the causal factors. If visitor

use were determined to be a contributor to the observed change in conditions, then the necessary visitor use management strategies would be implemented. Some of the management activities the National Park Service has been employing in relation to this issue include educating visitors to stay on trails, clearly marking designated trails, and restricting activities that may increase the introduction of invasive species.

PRIORITY SOCIAL INDICATORS

The priority social indicators for Muir Woods National Monument are associated with the issues of crowding and use conflicts. The Park Studies Laboratory at the University of Vermont has conducted a program of social science research at the monument from 2003 to the present (Manning et al. n.d.). These studies collected baseline data on visitor use and users (including detailed travel patterns throughout the park), potential indicators of visitor experience quality, potential standards of quality for specific types of crowding and use conflicts, and visitor attitudes toward alternative management practices. The research resulted in recommended potential indicators that included the number of people within a person’s view, noise impacts, and arrival delays, which contributed to a visitor’s perception of crowding and conflict while visiting Muir Woods (Manning et al. n.d.).

Additional visitor studies were targeted to collect data on visitor preference and acceptability of various use densities (people per view) along trails in the woods, the current number of encounters between groups along secondary trails, as well as number of people at one time in key interpretive areas, which contributed to selection of the standards for the interpretive corridor zone (Manning et al. n.d.). This zone contains both the primary use areas in the redwood forest (including the valley primary trails and interpretive areas such as the redwood cross-section and Pinchot Tree)

and secondary trails. Based on the desired conditions for the interpretive corridor zone and the need to manage the primary use areas in a different manner from the secondary trails, the approach for setting standards varied across these two areas. The primary use areas are managed to accommodate the highest levels of use in the monument—visitors have an expectation of seeing others in these areas. Given these expectations, the planning team assigned the level of use that was deemed acceptable by visitors in the visitor study as the standard for this area (a level that does not affect visitor experience to the extent that a visitor would not return). The secondary trails within the interpretive corridor zone are not intended for high use and there is an expectation for solitude and quiet in these areas, so the planning team assigned the level of use that was deemed preferred by visitors in the visitor study as the standard for this area (a level that does not require action by park management) (Manning et al. n.d.).

In addition, visitor reactions to visitor-caused noise were studied using a series of audio clips simulating a range of visitor-caused noise in the park; these findings contributed to the standards selected for this indicator. The indicators of the percentage of time human sounds are audible and sound pressure level were considered the most meaningful and measurable indicators related to visitor-caused noise (Newman and McCusker 2009).

Finally, the visitor studies evaluated visitor perceptions on acceptable waiting times to find parking and walking times from the parking area. This information, in combination with other national standards for wait times at high-use areas and attraction

sites, contributed to the selection of a standard for this indicator for both auto and shuttle visitors (Manning et al. n.d.; Orca Consulting 2008). Some of the existing management activities that the National Park Service has been employing in relation to these various social issues include educating visitors regarding low-impact practices, providing pre-trip planning information to encourage voluntary redistribution of use to less busy times, and employing the park shuttle system during peak periods to help modify the flow of visitor use to the woods.

MANAGING USE LEVELS

The level of use at Muir Woods National Monument is not as regulated as it is at Alcatraz Island, but it is currently constrained during the peak season by the amount of parking available and the frequency and size of shuttle buses. All of the alternatives for Muir Woods National Monument call for visitation to be better distributed and managed. However, it is uncertain at this time whether the amount of use per day, if better distributed and managed, would need to be further regulated in order to achieve the desired conditions and related standards identified for the monument. In order to better assess those needs, the National Park Service would continue to conduct analysis of visitor use patterns as part of planning for the redesign of the monument's entrance and parking areas, which is proposed in this plan's action alternatives. The implementation plan would closely examine the need for further regulation of the amount and timing of use as part of the alternatives for reduced parking and an increased emphasis on shuttle access.

TABLE 30. MUIR WOODS NATIONAL MONUMENT: USER CAPACITY INDICATORS, STANDARDS, MONITORING STRATEGIES, AND MANAGEMENT STRATEGIES

Indicator	Assigned Zone/Area	Standard	Monitoring Strategy	Potential Management Strategies
Topic: Visitor-created Informal Trails				
<p>Increase in the number of informal trails and change in the condition class of existing informal trails in the redwood forest.*</p> <p>*Problem analysis would be needed to isolate visitor-caused impacts.</p>	<p>Interpretive corridor zone – surrounding Redwood Creek.</p> <p>Sensitive resources zone – the upper slopes.</p> <p>Natural zone – western end of the monument at Mount Tamalpais State Park.</p>	<p>No increase in the number of informal trails, and no increase in the condition class* of existing informal trails from the previously monitored baseline. No class III trails.</p> <p>* Trail Condition Classification System: <i>Adapted from descriptive system by Jeff Marion, USGS.</i></p> <p>Class I Trail is barely visible. Minimal disturbance of organic litter or vegetation. Very little bare soil is evident along the tread.</p> <p>Class II Trail is obvious. Organic litter is disturbed or diminished in places. Slight loss or damage to vegetation. Bare soil is evident along the center of the tread.</p> <p>Class III Serious erosion is obvious. Nearly complete loss of organic litter and/or vegetation cover. Bare soil is widespread in a widening tread.</p>	<p>Periodic assessments would be conducted inside monument boundaries and possibly beyond if they are critical to forest health, e.g., areas in Mount Tamalpais State Park adjacent to Redwood Creek. Assessments would take place at the point where the informal trail begins, i.e., where it departs from an existing authorized trail.</p>	<p>§ Formal review of possible causes (including determining whether the informal trail is visitor use or animal related) and to determine most appropriate management response.</p> <p>§ Increase visitor education on low-impact practices and park regulations.</p> <p>§ Place border logs or other barriers along formal trails at the junction with informal trails.</p> <p>§ Restore informal trails by decompacting soils and moving organic debris onto the visible portion of the informal trails to hide them (for class II and III trails, natural topography would be restored prior to any addition of organic matter/litter).</p> <p>§ Add formal trailhead signs explaining the problem and asking visitors to remain on formal trails.</p> <p>§ Enhance marking of the official trail and/or improve adjacent designated trails.</p> <p>§ Formalize an informal trail, possibly on a new alignment, to accommodate visitor interest.</p> <p>§ Install temporary or permanent signs.</p> <p>§ Consider more substantial restoration work (after all foot traffic has been removed from the</p>

TABLE 30. MUIR WOODS NATIONAL MONUMENT: USER CAPACITY INDICATORS, STANDARDS, MONITORING STRATEGIES, AND MANAGEMENT STRATEGIES

Indicator	Assigned Zone/Area	Standard	Monitoring Strategy	Potential Management Strategies
				informal trail). § Increase enforcement or presence of rangers or volunteers. § Area closures. § Reduce use levels.
Topic: Impacts on Soundscapes from Human Noise				
Sound pressure level. Percent time human sounds are audible.	Interpretive corridor zone.	Daytime (0700–1900) L50 dBA: 34 (note: L50 is the sound level that is exceeded 50% of the time). Percent time human sounds audible: 45%.	Monitoring would be conducted on a periodic basis using digital recordings and/or on-site listening protocol as appropriate. If a standard is exceeded, the type and location of each contributing noise source would be identified.	§ Increase visitor education on low-impact practices and park regulations. § Designate more quiet zones and days. § Redistribute visitor flow and/or reduce use levels. § Increase education for organized groups. § Change in the regulations of organized groups (e.g., group size limits).
Difference between Lnat and existing ambient L50.	Natural and sensitive resources zones.	Difference between Lnat and existing ambient (L50) is 2 dBA or less during the daytime (0700–1900).	Monitoring would be conducted on a periodic basis using digital recordings and/or an on-site listening protocol as appropriate. If a standard is exceeded, the type and location of each contributing noise source would be identified.	§ Increase visitor education on low-impact practices and park regulations. § Designate more quiet zones and days. § Redistribute visitor flow and/or reduce use levels.

TABLE 30. MUIR WOODS NATIONAL MONUMENT: USER CAPACITY INDICATORS, STANDARDS, MONITORING STRATEGIES, AND MANAGEMENT STRATEGIES

Indicator	Assigned Zone/Area	Standard	Monitoring Strategy	Potential Management Strategies
Topic: Invasive Plant Species				
<p>Number of priority invasive plant species detections.*</p> <p>Extent of invasive plant cover.*</p> <p>*Problem analysis would be needed to isolate visitor-caused impacts.</p>	<p>All zones.</p>	<p>No increase in the number of new priority invasive plant species.*</p> <p>No increase in the percent cover.*</p>	<p>Continue monitoring per the Inventory and Monitoring Program.</p>	<p>§ Increase visitor education on low-impact practices and park regulations.</p> <p>§ Require the cleaning of gear that is capable of transferring plant material.</p> <p>§ Temporarily or permanently close areas.</p> <p>§ Reduce use levels.</p> <p>§ Removal of invasives and restoration of disturbed areas.</p>
Topic: Crowding and Congestion				
<p>PPV along valley primary trails.</p> <p>PAOT at the Pinchot Tree and Redwood Crosscut.</p>	<p>Interpretive corridor zone: primary visitor areas in the redwood forest including the valley trails, redwood cross-section, and Pinchot Tree.</p>	<p>No more than 18 PPV per 50-meter trail section along valley primary trails, 90% of the time during park operating hours.</p> <p>No more than 30 PAOT at the Pinchot Tree and Redwood Crosscut, 90% of the time during park operating hours.</p>	<p>PPV and PAOT would be measured by still photography from a few fixed positions at various times through the year. Visitor counts taken from the photographs would be used to determine the appropriate management actions. The standard for crowding and congestion (acceptability of PPV and PAOT range) would be updated by a focused survey every five years or when major changes are implemented.</p>	<p>§ Encourage voluntary redistribution of use across the day.</p> <p>§ Change the timing and availability of transit and tour bus access.</p> <p>§ Direct visitor flow to other areas and trails.</p> <p>§ Reduce use levels.</p>
<p>Number of encounters along secondary trails with other visitor groups (one or more people) traveling in the opposite direction.</p>	<p>Interpretive corridor zone: secondary trails including Hillside and Fern Creek.</p>	<p>No more than 40 encounters with other visitor groups traveling in the opposite direction, 90% of the time during park operating hours.</p>	<p>Encounter rates would be measured by an observer hiking along principal secondary trails at various times of day and days of week throughout the year. The data would be used to determine the appropriate management actions.</p>	<p>§ Encourage voluntary redistribution of use across the day.</p> <p>§ Change the timing and availability of transit and tour bus access.</p> <p>§ Direct visitor flow to other areas and trails.</p> <p>§ Reduce use levels.</p>

TABLE 30. MUIR WOODS NATIONAL MONUMENT: USER CAPACITY INDICATORS, STANDARDS, MONITORING STRATEGIES, AND MANAGEMENT STRATEGIES

Indicator	Assigned Zone/Area	Standard	Monitoring Strategy	Potential Management Strategies
			The standard for crowding and congestion (preference for encounter rates) would be updated by a focused survey every five years or when major changes are implemented.	
<p>Approximate arrival experience time (from arrival* to entering the interpretive corridor zone).</p> <p>*Arrival for auto visitors begins when vehicles turn off Muir Woods Road and into a parking lot at the monument.</p> <p>*Arrival for shuttle visitors begins when the shuttle bus pulls into the designated bus loading/unloading zone.</p>	Diverse opportunities zone.	Maximum arrival time of 20 minutes per individual or group, 90% of the time during park operating hours.	Regular observations of the arrival experience time would be conducted. This indicator and standard will be further tested and adjusted as part of implementation planning for increased shuttle access and the redesigned entrance to the monument.	<ul style="list-style-type: none"> § Encourage voluntary redistribution of use. § Redesign the arrival experience. § Institutionalize intelligent transportation systems with Caltrans. § Increase efficiencies at fee station. § Improve shuttle service. § Implement a reservation system for parking. § Provide advance trip planning information to encourage voluntary redistribution of use.