

Redwood

National Park

National Park Service
US Department of the Interior



Redwood National Park Trail and Backcountry Management Plan Environmental Assessment

Redwood National Park
Del Norte and Humboldt Counties, California
April 2009

**Redwood National Park
TRAIL AND BACKCOUNTRY MANAGEMENT PLAN**

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Redwood National Park TRAIL AND BACKCOUNTRY MANAGEMENT PLAN

Introduction

Redwood National Park is one of four individual parks that comprise Redwood National and State Parks (RNSP). These parks offer opportunities for exploration and recreational use of redwood forests, seashores, and stream and river valleys along the coastline of northwestern California. RNSP consists of Redwood National Park, Jedediah Smith Redwoods State Park, Del Norte Coast Redwoods State Park, and Prairie Creek Redwoods State Park. These parks are jointly managed as RNSP to improve protection of resources and opportunities for visitors to enjoy those resources.

The National Park Service (NPS) and the California Department of Parks and Recreation (DPR) are initiating a long-term program to expand the RNSP trail system. The expanded trail system would integrate the existing trail systems in the four parks, create trail connections to link the parks with adjacent public lands in Humboldt and Del Norte counties, and provide opportunities for extended trips in the region by providing more backcountry camps.

Backcountry includes those areas without road access or not accessible by private motor vehicle. The parks offer camping in primitive camps in the backcountry and dispersed backcountry camping along the Redwood Creek corridor.

Cooperative Planning and Management of RNSP Trails and Backcountry

Redwood National Park was created by Congress in 1968. Three California state parks established in the 1920s are included within the 1968 congressionally designated national park boundary—Prairie Creek Redwoods State Park, Del Norte Coast Redwoods State Park, and Jedediah Smith Redwoods. Congress expanded the national park in 1978, with most of the new lands added in the Redwood Creek basin. In 1999, the NPS and CDPR completed the joint RNSP General Management Plan/General Plan Final Environmental Impact Statement/Plan (GMP/GP) to manage the four parks units as a single park for better protection of resources and to improve opportunities for visitors to use and enjoy the parks. In 2002, CDPR acquired 25,000 acres in the Mill Creek watershed between Del Norte Coast and Jedediah Smith Redwoods State Parks. These lands were added to Del Norte Coast Redwoods State Park in 2004. In 2005, Congress adjusted the Redwood National Park boundary to encompass the newly acquired state park lands. CDPR is currently preparing an amendment (GPA) to the 1999 RNSP General Management Plan/General Plan (GMP/GP) to outline management for the Mill Creek lands.

This trail and backcountry management plan (TBMP) was initiated before the Mill Creek lands were added to RNSP. The TBMP acknowledges CDPR opportunities for trail development and use of the backcountry in the Mill Creek watershed but does not make any specific proposals for that area. Specific CDPR proposals for trail development and backcountry use in Mill Creek will follow the approval of the GPA by the California State Park and Recreation Commission and will require additional planning and public input.

Trail systems were developed over the years to serve each of the four individual parks that are now managed cooperatively as RNSP. There are currently only a few trails linking the park units that comprise RNSP or connecting with trails outside the parks.

The 1999 GMP/GP called for a comprehensive trail plan to guide development of an expanded trail system for the parks and for a backcountry management plan to describe policies and regulations governing visitor use of the backcountry in Redwood National Park. Policies for managing backcountry in Redwood National Park are described and analyzed in this TBMP/EA. Regulations are found in the Superintendent's Compendium, which is updated annually.

The existing RNSP trails will serve as the nucleus of an expanded system of park trails and trail links to regional trails in Del Norte and Humboldt counties. Existing RNSP trails open to visitor use are listed in Appendix A and depicted on the maps of the alternatives (Appendix I).

Conservation Planning on Federal and State Parklands

The NPS and CDPR conducted planning for this TBMP jointly to ensure that future trail systems are integrated among the four park units that comprise Redwood National and State Parks. This TBMP covers proposals for development of trails, trailheads, and backcountry camps on national park lands within the boundaries of Redwood National and State Parks (RNSP). The TBMP environmental assessment (TBMP/EA) is tiered off the 1999 EIS/R for the GMP/GP and covers proposed action and alternatives on federal lands within RNSP.

Because of differences between agency guidelines and regulations for implementing the federal National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), CDPR will prepare separate environmental documents for actions on state lands in compliance with CEQA.

Proposals for trails and trailheads on state park lands within the 2000 boundaries of RNSP are considered reasonably foreseeable future actions and are analyzed under cumulative effects. Appendix B lists the proposed trails throughout RNSP that have been considered during development of this plan regardless of land ownership. The list of trails includes trails in the state parks that were part of RNSP at the time the 1999 GMP/GP was approved as well as trails on state park lands that were not part of RNSP when the 1999 GMP/GP was approved.

Consultations with Other Agencies

Endangered Species Consultations—The NPS prepared two biological assessments on the potential effects on federally listed threatened and endangered species under the proposed action presented in this plan (Alternative D, the NPS preferred alternative) (Bensen 2005, 2006). Consultation with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries National Marine Fisheries Service (NMFS) in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 *et seq.*) has been

completed for the proposed NPS action. Some proposed actions that would be undertaken by the CDPR in the three state parks jointly managed with the NPS as RNSP have been included in the consultations. Construction of trails and trailheads within these state parks might require additional compliance under the California Endangered Species Act (CESA).

Consultation with the U.S. Fish and Wildlife Service—The NPS submitted a preliminary draft biological assessment (BA) to the USFWS Arcata Fish and Wildlife Office on September 19, 2002. The NPS and USFWS staff met to discuss the proposed project on September 24 and October 28, 2002 and April 8, 2003. The NPS submitted a draft environmental assessment to the USFWS on March 24, 2003. The USFWS provided comments on the draft environmental assessment on May 30, 2003. The NPS submitted subsequent draft BAs to the USFWS in August and November 2004, for which the USFWS provided comments in October 2004 and February 2005, respectively. The NPS requested formal consultation in April 2005 and met with USFWS in August 2005 to discuss concerns about effects on marbled murrelets. In October 2005, the NPS requested a delay in completion of consultation to consider changes to the proposed action to decrease impacts to marbled murrelets. Between February and May 2006, biologists from the NPS, California Department of Fish and Game, Humboldt State University, and the USFWS met to discuss management of corvids (a family of birds that are known to prey on nestlings of marbled murrelets and other birds) in RNSP. The NPS submitted new draft sections of the BA to the USFWS in May 2006 and received comments in August 2006.

The NPS submitted a final BA to the USFWS Arcata Fish and Wildlife Office on August 30, 2006. The NPS requested initiation of formal consultation under section 7 of the ESA for possible effects from the proposed action on the California brown pelican, Oregon silverspot butterfly, marbled murrelet, bald eagle, western snowy plover, and northern spotted owl. The USFWS issued a biological opinion file number 8-14-2003-1517, which was received by the NPS on January 31, 2007. The BO and consultation are valid through 2017.

The BA and the resulting BO address all actions to be undertaken by the NPS proposed in the TBMP associated with proposed trail and backcountry use, as well as use and operation of existing facilities including trails, trailheads, and campgrounds throughout RNSP. The NPS determinations and USFWS conclusions cover all of RNSP, including proposals that may be considered by CDPR in one of the three state park units included in RNSP.

The NPS determined, and the USFWS concurred, that the action proposed in the TBMP may affect but is not likely to adversely affect the bald eagle, brown pelican, and Oregon silverspot butterfly. The NPS action proposed in the TBMP for backcountry, trailhead, and trail construction, use, and/or maintenance will not affect western snowy plovers.

The NPS also determined, and the USFWS concurred in the same BO noted above, that the action proposed in the TBMP is not likely to jeopardize the continued existence of the

marbled murrelet or the northern spotted owl. Although there is no designated critical habitat for marbled murrelets in the national park, there is designated critical habitat in the state parks. However, the action proposed in the TBMP does not affect that critical habitat and no destruction or adverse modification of that critical habitat is anticipated. Critical habitat for the northern spotted owl has been designated but the action proposed in the TBMP does not affect that area and no destruction or adverse modification of that critical habitat is anticipated.

The NPS also requested, and the USFWS authorized, incidental take of marbled murrelets and northern spotted owls for actions proposed in the TBMP throughout RNSP. Incidental take is expected to be in form of

- harassment of marbled murrelets associated with 3,129 acres of occupied nesting habitat and of northern spotted owls associated with 2,059 acres of unsurveyed nesting and roosting habitat due to operation and use of existing facilities annually for 10 breeding seasons (2007 through 2017.)
- harassment of marbled murrelets associated with 384 acres of occupied nesting habitat and of northern spotted owls associated with 166 acres of unsurveyed nesting and roosting habitat due to the operation and use of new facilities annually from the date of construction through 2017.
- harassment of marbled murrelets and of northern spotted owls associated with 250 acres of occupied nesting habitat due to the use of chainsaws to clear a maximum of two fallen trees from the East Side Trail annually for 10 breeding seasons.
- harm of marbled murrelets associated with 10,289 acres of occupied nesting habitat due to an increased risk of corvid predation near existing facilities annually for 10 breeding seasons.
- harm of marbled murrelets associated with 1,250 acres of occupied nesting habitat due to an increased risk of corvid predation near new facilities annually from the date of construction through 2017.

Consultation with the National Marine Fisheries Service—The NPS initiated discussions with NOAA’s National Marine Fisheries Service (NMFS) staff from the Southwest Region Arcata Area Office in 2002 about the effects of proposals on listed anadromous fish and any designated critical habitat. NMFS provided technical assistance to the NPS between October 2002 and November 2004, including commenting on draft versions of the plan and environmental assessment; site visits; and discussions. The NPS requested consultation on the plan in March 2005 and submitted a BA to NMFS. The NPS subsequently requested that NMFS suspend consultation on the effects of the proposed action on listed fish while the NPS addressed concerns on terrestrial threatened and endangered species. In December 2005, NMFS recommended that all Federal agencies reinstate consultations on projects due to newly designated critical habitat for California Coastal (CC) Chinook salmon and Northern California (NC) steelhead.

The NPS submitted a final BA to NMFS on August 30, 2006, requesting initiation of consultation pursuant to section 7(a) (2) of the ESA and essential fish habitat (EFH) consultation pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996. The ESA consultation concerned the possible effects on the Southern Oregon/Northern California Coast (SONCC) coho salmon and CC Chinook salmon Evolutionary Significant Units (ESUs), the NC steelhead Distinct Population Segment (DPS), and designated critical habitats for these three species. The EFH consultation concerned the effects of the proposed action on EFH for Pacific Coast salmon. Following a request for additional information about critical habitat designation information in the BA, NMFS initiated formal consultation in October 2006. The results of the consultation are contained in NMFS BO, file number ARN # 151422SWR03AR8825, dated September 17, 2007.

NMFS concluded that the proposed actions in the trail and backcountry management plan are not likely to jeopardize the continued existence of SONCC coho salmon, CC Chinook salmon, or NC steelhead or result in the destruction or adverse modification of their designated critical habitats.

In addition, NMFS determined that the project would adversely affect Essential Fish Habitat (EFH) for various Federally managed fish species within the Pacific Coast Salmon Fishery Management Plan. However, no EFH Conservation Recommendations are necessary. The adverse effects on EFH would result from instream work required for culvert removal and watershed restoration associated with conversion of the West Ridge Road in Prairie Creek Redwoods State Park to a trail. This action will be undertaken by the California Department of Parks and Recreation, and is not part of the NPS proposed action.

The NPS requested, and NMFS authorized, incidental take of SONCC coho salmon juveniles, eggs, and alevin; CC Chinook salmon eggs and alevin; and NC steelhead juveniles for the short-term adverse effects from removal of the stream crossing on Prairie Creek for the West Ridge Road road-to-trail conversion in Prairie Creek Redwoods State Park.

Cultural Resource Consultations—Government-to-government correspondence with the Yurok Tribe occurred on April 20, 2001 during scoping for the proposed plan. The Yurok Tribe provided written comments on an early draft of the plan on May 18, 2001.

A face-to-face meeting to share information with affiliated Tribes and discuss the proposed trail plan was held at the RNSP maintenance offices at Aubell Ranch on March 15, 2005. The meeting was attended by RNSP staff and members Smith River Rancheria and Yurok Tribe staff. Elk Valley Rancheria, Smith River Rancheria, Tolowa Nation, Yurok Tribe, Resighini Rancheria, Trinidad Rancheria, and Big Lagoon Rancheria were invited to participate in a second meeting held the same day at the South Operation Center in Orick but no Tribal representatives attended.

Trail development has been discussed incidentally with local tribes during the course of regularly scheduled meetings and consultations for other projects.

Some of the proposed developments in the national park will require further site-specific planning prior to construction. Future site-specific planning will require additional compliance with the National Historic Preservation Act (NHPA) for trails, trailheads, and backcountry camps. Planning and construction of trailheads will also require additional compliance with NEPA. Consultation with the California SHPO under the NHPA, and with tribal governments including tribal historic preservation officers, will be conducted when site-specific planning commences.

Why A Trail System is Needed

The NPS proposes to develop a trail system over the next 15 years on national park lands in RNSP that provides safe access to the full range of park resources for hikers, bicyclists, and equestrians of all abilities, and that is integrated with the trail system in the three state parks within the NPS boundary.

This trail system is needed

- to provide visitors with opportunities to experience a wide range of park resources by foot, horseback or bicycle;
- to provide access to backcountry camps and camping areas;
- to provide safe and enjoyable recreational experiences for all trail and backcountry users; and
- to connect the trails in the national park with other park trails within RNSP and with trail systems outside these parks.

What is a Trail?

Trails include any route from a narrow footpath to a wide, paved, multi-user corridor not open to public motor vehicle use. Narrow paths constructed specifically for hikers, boardwalks, old logging roads, and road shoulders are all considered trails in this plan. Trails proposed in this plan are intended to serve as recreational and interpretive facilities from which visitors can experience, learn about, and enjoy the natural and cultural resources of RNSP.

What is Backcountry?

Backcountry in RNSP includes relatively undeveloped natural areas of the parks. Areas where little or no new development will be allowed under the current management outlined in the 1999 GMP/GP, pristine areas where there are few signs of human use, and areas being restored to natural conditions after logging are among the different types of backcountry in the parks. Remnants of human use may be present in some parts of the backcountry but any new developments will be subordinate to the natural and cultural resources of the area. The Wilderness Suitability Assessment conducted for Redwood National Park in 2005 concluded that it was premature to consider any lands within the park for further wilderness evaluation until watershed rehabilitation was completed on lands affected by logging. The proposals in the TBMP would not affect wilderness suitability of national park lands.

Backcountry camping as described in this plan includes camping both in designated backcountry camps or sites and “dispersed” camping in designated areas. In dispersed camping areas, campers are allowed to choose campsites anywhere in designated areas.

The Superintendent’s Compendium contains policies and regulations for use of backcountry on national park lands within RNSP, including pets, livestock, campfires, sanitation, trailhead use, areas open to camping, and visitor use limits.

Previous Trail Planning and Recommendations

Park planning documents that have addressed trail development or backcountry use in the RNSP include the 1980 General Management Plan for Redwood National Park, the 1985 General Plan for the Redwood State Parks, the 1984 Backcountry Trail Plan for Redwood and Skunk Cabbage Creeks, the 1996 Davison Ranch Development Concept Plan, and the 1999 GMP/GP. This TBMP is consistent with the direction of the 1999 GMP/GP, which is outlined below.

Statewide regulations and unit policies described in the 1985 Redwoods State Park General Plan (GP) guided backcountry use in each state park unit prior to the 1999 GMP/GP. The 1985 GP served as the conceptual plan for trail development in the three state parks. The NPS developed trails, trailheads and backcountry camps under the guidance of the 1980 GMP, a 1984 trail plan covering the southern part of the national park, and a 1996 development plan for the Davison Ranch area in the national park. Appendix C summarizes trail planning for RNSP prior to the 1999 GMP/GP.

Trail studies and plans for recreational development have recommended construction, preservation, or re-establishment of trails in RNSP and beyond park boundaries, after the expansion of Redwood National Park in 1978. These trails include the East Side Trail, the California Coastal Trail, the Kelsey Trail, the Trinidad Trail, and the Coast-to-Crest Trail.

Appendix D describes other planning by county, state, or federal agencies for other trails in the region and the relation between those trails and proposed trails in this plan. Appendix E summarizes links between existing and proposed trails within and beyond RNSP boundaries.

Trail and Backcountry Management Recommendations from the 1999 GMP

The 1999 GMP included the following recommendations for recreational activities that are fulfilled in the proposed TBMP. Actions that are on state parks lands are included, although these actions are not part of the NPS action proposed in this TBMP/EA.

- A comprehensive trail plan and backcountry management plan will be developed to guide the development of an expanded trail system for the parks, specify the locations of primitive camping areas, and prescribe policies and regulations for the use of backcountry areas by hikers, bikers, and equestrians.

- The new plan will be consistent with the desired resource conditions and visitor experiences of the appropriate management zones.
- The existing hiking, biking, and equestrian trails will provide the framework for the development of [an expanded] trail system.
- Additional opportunities for primitive camping will be provided in conjunction with the expanded trail system.
- The Redwood Creek basin offers extensive opportunities for developing trails and primitive camping areas that are isolated from the sights and sounds of traffic and developments along local highways and access routes.
- The plan will evaluate opportunities for developing trailheads, trails, and primitive camping areas along the West Side Access Road.
- As watershed rehabilitation in the Redwood Creek basin is completed, priority for use of the West Side Access Road will shift from exclusively administrative use to include public access as well.
- No campgrounds accessible by vehicle will be constructed in the Bald Hills.
- A variety of primitive walk-in, backpacking, equestrian, and bicycle camping opportunities will be provided in the parks at sites and in areas where camping is consistent with the characteristics of the applicable management zone.
- Camping will be allowed along the gravel bars of Redwood Creek and in designated horse camps on the west side of Redwood Creek.
- Additional primitive and/or walk-in camping opportunities will be provided along trails on both the east and west sides of the Redwood Creek basin and elsewhere in the parks, including the Coyote Creek basin.
- The RNSP trail system will be linked to gateway communities and to trails managed by other jurisdictions, forming a regional system of hiking, bicycle, and equestrian trails.
- Consideration will also be given, where appropriate and in partnership with the private sector or American Indian tribes, to connecting the parks' trail system with public use facilities adjacent to the parks.
- The network of trails will serve visitors interested in day use opportunities as well as those who seek outstanding backcountry/overnight trip opportunities.
- The parks' trail system will provide visitors of all ages opportunities to enjoy examples of all of the parks' primary resource settings, including old-growth forests, second-growth forests, prairies, streams, seashores, and cultural landscapes.
- High priorities for new hiking trail construction include completing the Coastal Trail; providing trail connections between major trails such as the Coastal Trail to the Redwood Creek basin, Jedediah Smith Redwoods State Park to the Coastal Trail, and the Coastal Trail to the Pacific Crest Trail; and establishing a trailhead on the Aubell property for trail access into the west side of Jedediah Smith Redwoods State Park.
- High priority will be places on the developing new hiking trails in the Redwood Creek basin, including the East Side Trail authorized in the national park enabling legislation.
- A limited number of new mountain bike trails will be constructed or designated in areas of the parks where bicycle use will not damage resources and it meets federal and state policies for such use.

- Mountain bike loop trails opportunities will be developed on roads in the Coyote Creek basin.
- No equestrian trails will be provided on the east side of the Redwood Creek basin.

The Current RNSP Trail System and Trails Operations

This section describes existing hiking, equestrian, and bicycle trails, major trailheads, current backcountry regulations, and available statistics on visitor use of these facilities. See Appendix A for a list of maintained trails in RNSP. Existing trails, trailheads and backcountry camps are shown on the graphics depicting the alternatives. Table 1 shows the mileage of each trail type in each park unit. Some of the major trails are discussed below in relation to proposals in this plan.

Table 1–Current RNSP Trail System Mileage and Backcountry Camps

Park Unit	Hiking	Equestrian	Bicycle	Backcountry Camps (# Campsites)
JSRSP	18.5*	2.0*	1.5*	0
DNCRSP	17.5	0	4	0
PCRSP	55.4**	0	4.5**	3 (9)
RNP	43.8*	42.8*	21.5*	6 (36****)
Total RNSP Miles/Camps	135.2	44.8	31.5	9 (45)

* includes Little Bald Hills multi-use trail

** excludes Gold Bluffs Beach and Davison Roads

*** includes 4 individual sites in Little Bald Hills and 7 in Orick Horse Trail equestrian camps (3 in Elam Creek, 4 in Forty Four Creek)

Trails–The RNSP trail system includes over 130 miles of hiking trails, almost 45 miles of equestrian trails, and more than 31 miles of bicycle trails throughout Redwood National Park and the 3 state parks excluding the Mill Creek watershed portion of Del Norte Coast Redwoods State Park (see Table 1). Some of the trail miles in Table 1 are counted more than once because equestrian and bike trails are also open to hiking. The Little Bald Hills Trail is also open to horses and bikes. The Orick and Mill Creek horse trails are counted only under equestrian trails, and the Lost Man Creek-Holter Ridge bike trail is counted only under bike trails.

California Coastal Trail–The California Coastal Trail (CCT) includes approximately 36 miles of hiking trail through RNSP, excluding Gold Bluffs Beach Road and Coastal Drive, which are motor vehicle roads. Hikers cross the Klamath River on the Highway 101 bridge. The CCT in RNSP includes the Last Chance section of the old Redwood Highway from the trailhead at Enderts Beach Road to Last Chance Grade, where the trail crosses Highway 101 in Del Norte Coast Redwoods State Park. The Old Redwood Highway that is now the CCT is listed on the National Register of Historic Places (NRHP).

East Side Trail—Slightly less than four miles of hiking trail have been constructed along the east side of Redwood Creek between Orick and the Tall Trees Grove. The Lady Bird Johnson Grove Trail (1.3 miles), 0.5 mile of the Tall Trees Trail, and about one mile each of the Emerald Ridge Trail and the Dolason Prairie Trail are complete. Until a trail can be completed, the Redwood Creek Trail and trail head partially fulfill the legislative provision that the East Side Trail should connect “with the roadhead on the west side of the park east of Orick.” The existing Redwood Creek Trail is constructed on old logging roads on both sides of Redwood Creek. The Redwood Creek Trail requires two creek crossings, which makes the trail unusable, unsafe, or inconvenient as a hiking route to the Tall Trees Grove when stream flows are high or when the temporary bridges are not in place during the summer season.

Kelsey Trail—A portion of this historic wagon trail is incorporated into the Little Bald Hills Trail in the northern part of RNSP. The original Kelsey Trail route between Crescent City and Little Bald Hills over Howland Hill into the Mill Creek watershed has probably been obliterated by logging. Other portions of the original trail are obscured by the current dense vegetation and logging road network. The U.S. Forest Service established the South Kelsey Historical Trail in Del Norte County and Siskiyou County, and the Kelsey National Recreational Trail in Siskiyou County on portions of the old trail route. The USFS will reconstruct an additional ten miles of the historic Kelsey Trail route in four segments between the Little Bald Hills Trail and Harrington Mountain on the crest of the Siskiyou Mountains.

Equestrian Trails—RNSP contains almost 45 miles of equestrian trails. Thirty-four miles of equestrian trails on the west side of Redwood Creek in the national park provide rides ranging from a few hours to several days. In the northern part of RNSP, the Mill Creek Horse Trail and the Little Bald Hills Trail provide opportunities for equestrians. Equestrian trails are open to hiking, and the Little Bald Hills Trail is also open to mountain bikes. Three backcountry camps (Little Bald Hills, Elam Creek, Fortyfour Creek) serve the equestrian trails. The 1999 GMP directs that no equestrian trails will be provided on the east side of the Redwood Creek basin.

Bicycle Trails—RNSP has more than 32 miles of bicycle routes and trails. These trails are accessible by wide-tired mountain bikes. All roads open to motor vehicles are also open to bicycles.

Trail Maintenance—Some trails including the Last Chance section of the Coastal Trail, the Little Bald Hills Trail, and the Redwood Creek Trail have been converted from former motor vehicle roads that were designed for heavy vehicles used for logging operations. Grades designed for motor vehicles are often steeper than desirable for hiking trails. These “legacy” roads were generally built for commercial logging operations without consideration of effects on park resources or the visitor experience. Trails converted from roads reduce the amount of new disturbance to park resources but this advantage is offset by higher maintenance and repair costs.

Portions of some trails may even have been constructed on roads originally designed for wagons and reconstructed after the advent of automobiles. A study on historical roads and trails in the parks describes roads constructed prior to automobile roads as “atrocious” and “steep, dangerous, and rough” with “little thought ... given to making easy grades, and no effort at all ... to eliminate hairpin turns” (Bears, 1969).

Heavy equipment is essential for trail maintenance on converted roads because the original drainage system and road surface were designed and constructed to withstand significantly wider and heavier loads than those expected on most trails. Many of these former roads require major rehabilitation to restore adequate drainage or to prevent failure from ground slumping and landsliding. Trails converted from roads fail more often than other park trails because it is difficult to keep up with the maintenance when heavy equipment is required. Where possible, hiking trails are constructed on an alignment chosen specifically to minimize adverse impacts to resources and to provide an esthetically pleasing experience for visitors. These trails can be maintained at a lower cost using smaller tools and equipment, and generally do not pose the same threats to resources as converted roads.

Vegetation management along trails is a major maintenance task in RNSP. Vegetation management problems along RNSP trails include removal of large fallen trees or limbs and rapid re-growth of dense understory vegetation. Power tools rather than hand tools are essential for efficient trail maintenance. If a very large redwood tree falls across a trail, trail maintenance crews determine whether it would be more effective to cut a path through the log or to re-route the trail around it. Re-routing is rarely feasible unless the re-route is minor because the proper trail grade must be maintained and the two segments of the trail must meet.

Trail and Backcountry Use

The NPS maintains statistics on total park visitation (Table 2), some trails and trailheads (Table 3), and backcountry camping (Table 4).

Table 2: Total NPS Visitation at RNSP

2000	2001	2002	2003	2004	2005	2006	2007
383,246	388,389	404,787	410,498	396,402	394,144	383,780	378,068

Tables 3 and 4 show numbers of visits or overnight stays recorded from 2000 through 2007 at 3 trailheads, 6 NPS backcountry camps, and dispersed camping on Redwood Creek gravel bars.

Table 3–Visits to Trailheads

Year	Tall Trees Grove	Lady Bird Johnson Grove	Redwood Creek
2000	9250	35,001	5983
2001	7843	52,498	6583
2002	9058	47,951	6516
2003	6841	34,757	30,606**

Year	Tall Trees Grove	Lady Bird Johnson Grove	Redwood Creek
2004	7252	32,364	49,774
2005	6393	32,466	54,987
2006	6236	50,586	42,644
2007	7154	61,551	42,340

** counting technique changed to electronic vehicle counts multiplied by estimated number of people per vehicle

There are currently 5 NPS backcountry camps in RNSP to serve hikers and equestrians, with a total of 37 designated campsites. Camps in the national park are located along the Coastal Trail at Nickel Creek (5 sites), DeMartin Prairie (10 sites), and Flint Ridge (11 sites). NPS equestrian camps are located in the Little Bald Hills (4 sites or a group camp) in Del Norte County and on the west side of the Redwood Creek basin at Elam Creek (3 sites or 1 group camp). Fortyfour Creek has 4 sites or 1 group camp; it is currently open only to backpackers but will be re-opened to equestrians if it is relocated to a site with more stable soils and less potential for impacts to water quality from pack stock. No more than 2 tents per individual site are allowed.

Overnight stays are counted by numbers of permits issued for Redwood Creek gravel bars and Redwood Creek equestrian camps, and by numbers of tents at each of 4 backcountry camps.

The Nickel Creek camp receives the heaviest use of the NPS backcountry camps, with an average annual use of 164 overnight stays per campsite between 2000 and 2006. The Flint Ridge camp had an average annual overnight use of about 80 stays per campsite during the same period. The approximate average annual use of the DeMartin Prairie, Little Bald Hills and the two Redwood Creek Horse camps were 12, 15, and 29 overnight stays per campsite respectively. An average of about 1000 people camp on the Redwood Creek gravel bars annually.

Table 4—Overnight Stays in NPS Backcountry Camps and Redwood Creek area

	Nickel Creek (5 sites)	Flint Ridge (9 sites)	DeMartin Prairie (11 sites)	Little Bald Hills (4 sites)	Redwood Creek horse camps (7 sites)	Redwood Creek gravel bars
2000	1033	1028	129	103	256	1148
2001	775	821	66	81	49	1488
2002	800	802	71	76	63	1577
2003	833	669	75	25	115	980
2004	954	643	86	44	421	971
2005	745	590	275	10	339	692
2006	605	515	210	77	164	945
2007	454	509	209	138	322	505

All NPS backcountry camps are currently available without a permit on a first come, first served basis.

Dispersed camping is currently allowed with a free NPS permit on gravel bars along the main channel of Redwood Creek upstream of McArthur Creek to the park boundary, except within 0.25 mile of the Tall Trees Grove. Most camping along Redwood Creek occurs from the mouth of McArthur Creek upstream to approximately one mile upstream of the mouth of Bridge Creek where the creek channel becomes a narrow gorge with few flat areas or gravel bars suitable for camping. Sandy areas along Redwood Creek generally receive heavier use than rocky areas. The gravel bars along Redwood Creek end at a location known as Rocky Gap where the creek flows through a narrow bedrock channel rather than through broad flat gravel bars. The stream distance from McArthur Creek to Rocky Gap is approximately 9.25 miles. In addition to the prohibition against camping within 0.25 mile of the Tall Trees Grove, no camping is allowed within 50 feet of a potable water source such as a side stream or on a trail, trailhead, or road.

Park regulations require all campers to store food and other scented materials properly, to maintain a clean camp to avoid attracting wildlife, particularly bears, and to dispose of waste properly. Campfires are permitted in designated backcountry camps only in park-provided grills and fire rings. No ground fires are allowed outside of park-provided fire rings or grills except by permit on the Redwood Creek gravel bars.

Public Participation in Trail and Backcountry Planning

The NPS and CDPR sought input for this plan from the public, park and other agency personnel, agency directives, policies, and guidelines, and applicable laws and regulations. Trail users, interested members of the public, federal, tribal, state and local agency personnel, park staff, and local residents contributed written comments and suggestions and raised issues and concerns in public meetings.

Public scoping for trail development and backcountry use was conducted in the fall of 1999. This scoping included public meetings, requests for written comments and discussions with agencies, organizations and individuals. Public comments from the 1999 GMP/GP plan and the 1996 Davison Ranch planning also served as a source of information.

Almost 90 trails were proposed during the public scoping process. A set of 32 criteria developed by CDPR to plan trails in Humboldt Redwoods State Park were used to rank proposed trails based on effects to resources and on visitors (Appendix F). The highest ranked trails were used to develop Alternatives B, C, and D.

Planning Issues Raised During Public Scoping

- There should be more access to the national park.
- More development is needed to keep people in the area longer and fulfill the economic promise of Redwood National Park.
- Trails should serve different user groups and users of all abilities, and be barrier-free.

- There should be trails of different lengths, from short loop trails for visitors with only a short time to spend in the parks to longer trails for extended backpacking, with more designated backcountry camps.
- More maintenance of the existing trails is needed, not more construction.
- The Coastal Trail should connect with trails inland and with trails outside the parks.
- Park trails should connect with other park trails to form loops.
- There are conflicts between hikers, equestrians, and bicyclists if they have to share trails.
- It's unsafe for bicyclists to ride along the shoulders of Highway 101.
- Sensitive resources have to be protected from impacts from trail development and trail use.
- Old roads should be used to create more trails.
- Sections of existing trails should be rerouted if resources or visitor safety are threatened.

Planning Goals and Objectives

Planning goals and objectives were derived from public and agency issued raised and comments received at scoping sessions for this plan and from past planning efforts, comments on written plans, and unsolicited suggestions and letters received by the NPS. Goals from the 1999 GMP/GP are marked with an asterisk (*).

Goals are long-term or general statements about trails and backcountry use that the NPS hope to achieve over the next 10 years. Objectives are more specific conditions that can be achieved in a shorter time.

Trail and Backcountry Management Planning Goals

- Manage recreational opportunities and settings to protect resources, promote public safety, and avoid public use conflicts. *
- Provide opportunities for public access to the full range of RNSP resources and in a variety of locations. *
- Provide trail access to all parts of the parks for different user groups of all ages and abilities. *
- Develop a trail system that minimizes resource impacts and can be maintained effectively for resource protection and public safety.
- Develop a trail network to provide both day use and backcountry/overnight opportunities. *
- Increase opportunities for extended stays in the area in support of sustainable economic development in gateway communities. *
- Participate as partners in projects with mutual benefit that enhance the quality of the overall visitor experience. *

Trail and Backcountry Management Objectives

- Locate and construct trails so resources are protected and maintenance costs reduced.
- Build out from existing access roads and trailheads to minimize new impacts.
- Complete the East Side Trail in the Redwood Creek basin. *
- Complete the California Coastal Trail within RNSP boundaries. *
- Connect the California Coastal Trail to inland RNSP trails and to the Pacific Crest Trail. *
- Connect park trails with public use facilities adjacent to the parks. *
- Provide primitive camping opportunities along trails on both the east and west sides of the Redwood Creek basin and elsewhere in RNSP, including the Coyote Creek basin. *
- Evaluate opportunities for developing trailheads, trails, and primitive camping opportunities along the West Side Access Road. *
- Increase the number of barrier-free trails and improve accessibility of backcountry camps. *
- Create loop trails with a variety of lengths and difficulty.
- Extend the length of stay possible in the backcountry by creating longer trails with backcountry camps located a day's hike from trailheads and other camps. *
- Construct or designate a limited number of new mountain bike trails where appropriate. *
- Develop a mountain bike loop on existing roads in the Coyote Creek basin in the national park. *
- Establish at least one backcountry camp accessible by off-road bicycles.

Resource and Visitor Protection Issues and Concerns

The NPS is charged with protecting resources while providing appropriate opportunities for visitors to use and enjoy the resources in the parks. Development and use of trails and backcountry can affect natural and cultural resources such as wetlands, endangered species, and archeological sites. Park resources can also affect the visitor experience if those resources relate to visitor health and safety. Some aspects of visitor use affect the experience and enjoyment of other visitors. These general concerns were incorporated into evaluation process for choosing which proposed trails would be included in the trail construction program. Impacts to specific resources and to the visitor experience and how these impacts would be avoided or minimized are addressed in the Environmental Consequences section of the environmental assessment.

Resource protection issues related to proposals considered in this plan include:

- Trail surface compaction, erosion and rutting in relation to visitor safety and to resource protection.
- Impacts to vegetation from visitor use including gathering firewood and unintentional introduction of invasive exotic plants.
- Noise and disturbance to other visitors and to wildlife.
- Protection of endangered species, particularly threatened birds and anadromous fish

- Increased risk of spreading pathogens that cause Sudden Oak Death and Port-Orford-cedar root disease through recreational use in infested areas.
- Protection of aquatic resources including riparian areas, streambanks, and streambeds.
- Access to cultural resources and protection of those sites.
- Increased risk of wildfire from campfires.
- Vandalism and theft of resources.

Issues and concerns related to the visitor experience and operational concerns include:

- Visitor health and safety.
- Search and Rescue for lost or injured visitors.
- Threats from the physical environment such as high tides, high winds, steep cliffs and wildfire.
- Threats from plants and wildlife such as falling limbs, poison oak, ticks, bears and mountain lions.
- Sanitation and water quality concerns.
- Criminal activity such as vehicle break-ins and vandalism to park facilities.
- Conflicts between hikers, equestrians and bicyclists.
- Visitor safety along major public roads and conflicts between hikers, bicyclists and highway traffic.

ENVIRONMENTAL ASSESSMENT

Purpose and Need for Action

The NPS proposes to construct new trails, trailheads and backcountry camps in Redwood National Park and to manage backcountry use so that visitors enjoy park natural and cultural resources in a safe manner with minimal adverse impacts to those resources.

The purpose of this action is to expand the trail system in the national park, to connect the national park trails with the state park trail system, and to provide park visitors with the opportunity to experience the full range of park resources and ecosystems. The RNSP trail system would provide opportunities for hikers, bicyclists, and equestrians of all abilities.

This trail system is needed to provide visitors with opportunities to visit the full range of park resources by foot, horseback or bicycle; to provide access to primitive or backcountry camping areas in RNSP; to reduce barriers and provide safe and enjoyable recreation for all trail and backcountry users; and to connect the trails with the other RNSP trails and with trail systems outside these parks.

Summary of Alternatives, Including the Proposed Action

This environmental assessment presents a no action alternative and three action alternatives for development and management of a trail system and backcountry use on federal lands in RNSP.

The alternatives address proposals for

- construction of backcountry camps, trailheads, and trails including four different routes for an East Side Trail;
- camping and campfire regulations, permits, and fees;
- visitor use limits at camping areas;
- designation of dispersed camping areas; and
- public motor vehicle use of the West Side Access Road along the southwest boundary of the national park.

Proposed trails are identified by a name and a capital letter, e.g. the Hiouchi Flat Trail (A) or the Berry Glen hiking trail (W). Maps showing each alternative are in Appendix I at the end of the document.

East Side Trail—Several alternative routes for a hiking trail on the east side of Redwood Creek were considered during the planning process. Under alternative A (no action), the East Side Trail (Trail M^A) would be constructed primarily through old growth forest for about 8.25 miles between Lady Bird Johnson Grove and the Tall Trees Grove, as proposed in the 1999 GMP. Under alternative B, 11.3 miles out of 12.9 miles of East Side Trail (M^B) would skirt the edge of old growth forest wherever possible from Lady Bird Johnson Grove to the Tall Trees Grove and continue beyond the existing Emerald Ridge and Dolason Trails to join the Lyons Ranch Trail (trail Q2). In alternative C, about 10.3 miles of the total 12.8 miles of East Side Trail (M^C) would run through old growth

forest wherever possible rather than on the edge of the old growth. M^C would continue beyond the existing Emerald Ridge and Dolason Trails to join the Lyons Ranch Trail (trail Q1 loop). Under the proposed action (Alternative D), the primary long-distance hiking trail access from Orick to the Tall Trees Grove would continue to be the Redwood Creek Trail. The Redwood Creek Trail crosses to the east side of the creek downstream of the Tall Trees Grove. Past the Tall Trees Grove, the Emerald Ridge Trail joins the existing Dolason Trail. Under the proposed action (Alternative D), the East Side Trail (M^D) would run another 7 miles from the junction of the Emerald Ridge and Dolason Trails to join the proposed Lyons Ranch Trail (trail Q2). About half of proposed East Side Trail M^D would run through blocks of old growth forest with the rest of the trail skirting the edge of old growth.

Alternative A: No Action

The no action alternative means that there would be no change to the existing situation and the current management direction for trail development and backcountry use. All existing trail and backcountry management policies and regulations would remain unchanged under the no action alternative. Under the no action alternative, there would be no construction of new trailheads, backcountry camps, or trail segments other than those previously approved through earlier planning efforts for Davison Ranch (1996) and the 1999 GMP/GP. These previously approved trails include the East Side Trail between Lady Bird Johnson Grove and the Tall Trees Grove (trail M^A), and 4 trails approved through the Davison Ranch planning process.

The Davison Ranch trails that are approved but not yet constructed include a 2.1-mile hiking trail between Berry Glen and Lady Bird Johnson Grove (W); a 1.9-mile hiking link to the Skunk Cabbage section of the Coastal Trail that runs from the Trillium Falls Trail up the north side of Skunk Cabbage Creek (trail X); a 3.7-mile Skunk Cabbage mountain bike loop using abandoned logging roads (trail V); and an equestrian trail west of Davison Ranch with several segments totaling 8.4 miles (trail Y).

Dispersed camping on the gravel bars within the Redwood Creek channel would continue to be permitted from the mouth of McArthur Creek upstream to the park boundary, except within 0.25 mile of the Tall Trees Grove. The gravel bars end at a location on Redwood Creek called Rocky Gap, so there is little or no gravel bar camping possible upstream of Rocky Gap. The stream distance from McArthur Creek to Rocky Gap is approximately 9.25 miles. Visitors almost never camp farther than about a mile upstream of Bridge Creek because the creek channel becomes a steep-sided rocky gorge with little or no flat area suitable for camping.

Alternatives B, C and D: Increased Trail and Backcountry Opportunities

Eighty-seven trail routes were suggested during public scoping. Some of these trails are located in the state parks that are part of RNSP. Site-specific planning, layout and environmental analysis for proposed state park trails will be done as funding becomes available.

The California State Parks North Coast Redwoods District trail ranking system was used to select a set of trails that met the planning objectives. Appendix F describes the process for choosing which of the 87 trails would be considered in more detail in an alternative. The trails were ranked by assigning points based on impacts to resources and benefits to visitors. Points were subtracted for adverse effects to resources and added for benefits to visitors. The trails that received the highest scores are included in Alternative C, the recreation focus alternative. Alternatives B and D were developed by considering the potential impacts on natural and cultural resources from the proposed construction program, and modifying or deleting those proposals that contributed disproportionately to impacts on resources.

Scoring criteria did not include the length of a proposed trail, the estimated construction cost, or the likelihood of obtaining funding for construction. Two trails that did not originally rank among the highest scoring trails were added to the proposed trail construction program under Alternative C because these trails were needed to provide access to backcountry and the proposed dispersed camping area in the Bridge Creek (trail T) and Tom McDonald Creek (trail S) watersheds.

Trails that received the highest matrix scores were reconsidered in terms of cumulative effects on resources, the cost and difficulty of constructing the proposed trail, the likelihood of obtaining funding for construction, and the importance of the trail in relation to RNSP development and visitor use goals outlined in the 1999 GMP/GP. This subset of trails is included in Alternative C, the recreation focus alternative. Alternatives B (moderate development) and D (the NPS preferred alternative and the proposed action) were developed by deleting some proposed facilities in Alternative C after considering the effects on sensitive resources and the visitor experience, the time required to construct all the proposed facilities, and the likelihood of obtaining funding for construction. All proposed trails and trailheads are listed in Appendix B.

Trail names used in this plan reflect geographic location. Final names for trails will be chosen after construction. Proposed new trails are identified by a geographic location and a letter, e.g. East Side Trail (M). The East Side Trail (M) and the Lyons Ranch Trail (Q) have different alignments under different alternatives. The different Lyons Ranch trail proposals are identified as Q1 or Q2 and the East Side Trail proposals as M^A, M^B, M^C, and M^D. The alphabetic lettering system for proposed trails starts in the northern part of RNSP and runs south. All trails are hiking trails unless identified as equestrian or bike trails. Estimated mileages for proposed trails are calculated from the RNSP geographic information system (GIS) database from conceptual alignments plotted on topographic maps.

Table 5–Summary of Proposed Trail and Backcountry Management Actions

	Alternative A (No Action)	Alternative B	Alternative C	Alternative D (proposed action)
Proposed Trails				
hiking trails	M ^A , W, X (12.5 mi)	A, G, H, M ^B , O, P, Q2, R, W, X (24 mi)	A, G, H, I, J, K, M ^C , O, P, Q1, R, S, T W, X (49.7 mi)	A, G, H, M ^D , O, Q2, W, X (16.7 mi)
equestrian	Y (8.3) new	Same as Proposed	Same as A	no new
bicycle	V (3.7 mi)	Same as proposed	L, U, V (14)	L, U (10.3 mi)
Proposed Trailheads	none	3	7	2
Wilson Creek		YES	YES	YES
Alder Camp Rd /Coastal Drive			YES	
Whiskey 40		YES	YES	
Coyote Peak Road			YES	
A-9 Deck horse		YES	YES	YES
N of B-5-2 Road			YES	
WSAR near Rodgers Peak			YES	
Mill Creek Horse Trail	No change	Same as proposed	Same as proposed	Safety redesign
Lyons Ranch Trail	No change	Same as proposed	Same as proposed	Safety redesign
Proposed Backcountry Camping		4 new camps/19 sites	5 new camps/24 sites	2 new camps/9 sites
Skunk Cabbage Ck		YES	YES	YES
Miller Creek		YES	YES	
Counts Hill		YES	YES	
Copper Creek		YES	YES	YES
Coyote Ck bike/hike			YES	
Fortyfour Creek	No change	Same as proposed	Same as proposed	Relocate to G-6-1 Rd
West Side Dispersed			YES	
Redwood Creek gravel bars	McArthur Creek mouth upstream to park boundary	Same as A	Same as A	No camping along 4 miles from McArthur Creek upstream to Bond Creek after 2009
Backcountry permits & fees	Free permit for Redwood Ck gravel bars	Same as proposed	Same as proposed	Free permits for all backcountry camping in RNSP
West Side Access Road	Closed to public	Same as proposed	Open to park boundary	Open to A-9 deck

Summaries of Action Alternatives

The three action alternatives are summarized in the following section. Table 5 “Summary of Trail and Backcountry Management Alternatives” summarizes and compares the main proposals of the three action alternatives with the current trail and backcountry management program (Alternative A: no action) in RNSP.

Summary of Alternative B (Moderate Development)

Under this alternative, the NPS would construct 10 hiking trails, 3 trailheads and 4 backcountry camps, and designate 2 routes for off-road bikes, in addition to other actions summarized below.

- Construct 10 hiking trails totaling 24 miles. Two of these trails (4 miles total) were approved in the 1996 Davison Ranch development plan but were not constructed because planning for the 1999 GMP began shortly after the Davison Ranch plan was approved.
- Designate 2 off-road bike routes on 10.3 miles of former logging and ranch roads.

Three new trailheads would be constructed

- north of Wilson Creek on the east side of Highway 101 in the Myrtle Avenue/Rudisill Road area in Del Norte County.
- at the Whiskey 40 area along the Bald Hills Road in Humboldt County.
- at the A-9 deck along the West Side Access Road on the west side of Redwood Creek in Humboldt County.

Existing trailheads would be redesigned to improve safety and efficiency of pedestrian and vehicle circulation at

- Lyons Ranch trailhead off Bald Hills Road in Humboldt County.
- Mill Creek Horse Trail trailhead off Howland Hill Road in Del Norte County.

Four new backcountry camps would be constructed at

- Skunk Cabbage Creek section of the Coastal Trail near the southern end of Gold Bluffs Beach.
- Miller Creek on the East Side Trail (M^B) in the Redwood Creek basin,
- Counts Hill Prairie on the extended East Side Trail (M^B).
- Copper Creek on the extended East Side Trail (M^B).

The existing backcountry equestrian camp at Fortyfour Creek in the Redwood Creek basin would be redesigned for accessibility after being relocated to the G-6-1 Road to improve resource protection, visitor safety, and accessibility for visitors of all abilities, and to provide an adequate stock water source.

All camping in the existing and proposed backcountry camps, equestrian camps and dispersed camping areas in RNSP would require a free permit, as is currently required for

camping on the Redwood Creek gravel bars. Camping would be continue to be allowed on the gravel bars on Redwood Creek from McArthur Creek upstream to the park boundary, except for the existing prohibition against camping 0.25 mile on either side of the Tall Trees Grove.

The West Side Access Road along the national park boundary on the west side of the Redwood Creek basin would be opened to public motor vehicle use as far as the proposed A-9 Deck trailhead to allow access to the existing equestrian trails and backcountry camps on the west side of Redwood Creek.

Summary of Alternative C (Recreation Focus)

Under this alternative, the NPS would construct or designate 19 hiking, horse and bike trails; 7 trailheads; and 5 backcountry camps, in addition to other actions summarized below.

- Construct 49.7 miles of new hiking trails, including 4 miles for 2 hiking trails approved in the 1996 Davison Ranch development plan but were not constructed because planning for the 1999 GMP began shortly after the Davison Ranch plan was approved.
- Construct 1 new equestrian trail (8.3 miles) approved in the 1996 Davison Ranch development plan.
- Designate 14 miles of former logging and ranch roads for 3 off-road bicycle (mountain bike) routes.

Seven trailheads would be constructed at the following locations:

- north of Wilson Creek on the east side of Highway 101 in the vicinity of Myrtle Avenue/Rudisill Road in Del Norte County.
- the junction of Alder Camp Road and Coastal Drive in Del Norte County.
- the Whiskey 40 area along the Bald Hills Road in Humboldt County.
- off the Bald Hills Road at the junction of Coyote Peak Road and Rock Fork Road in Humboldt County.
- the A-9 deck along West Side Access Road.
- two other locations along the West Side Access Road.

Two existing trailheads would be redesigned for safety and to improve pedestrian and vehicle circulation patterns at

- Lyons Ranch trailhead off Bald Hills Road in Humboldt County.
- Mill Creek Horse Trail trailhead off Howland Hill Road in Del Norte County.

Five new backcountry camps would be constructed at

- Skunk Cabbage Creek section of the Coastal Trail near the southern end of Gold Bluffs Beach.
- Miller Creek on the East Side Trail (M^C) in the Redwood Creek basin.
- Counts Hill Prairie on the extended East Side Trail.

- Copper Creek on the extended East Side Trail.
- Coyote Creek mountain bike route (U) in the Redwood Creek basin.

The existing backcountry equestrian camp at Fortyfour Creek in the Redwood Creek basin would be redesigned for accessibility after being relocated to the G-6-1 Road to improve resource protection, visitor safety, and accessibility for visitors of all abilities, and to provide an adequate stock water source.

A new dispersed camping area would be designated on the west side of Redwood Creek in the Tom McDonald Creek, Bridge Creek and Devils Creek watersheds. All camping in the existing and proposed backcountry camps, equestrian camps and dispersed camping areas in RNSP would require a free permit, as is currently required for camping on the Redwood Creek gravel bars. Camping would be continue to be allowed on the gravel bars from upstream of McArthur Creek to the park boundary, excluding a quarter-mile on either side of the Tall Trees Grove.

The West Side Access Road along the national park boundary on the west side of the Redwood Creek basin would be opened to public motor vehicle use for access to the existing equestrian trails and backcountry camps, and the proposed hiking trailheads and dispersed camping area. No trailers would be allowed past the A-9 trailhead.

Summary of Alternative D (Proposed Action, NPS Preferred Alternative)

Under this alternative, the NPS would construct 8 hiking trails, 3 trailheads and 2 backcountry camps; designate 2 bike routes; and take additional actions summarized below.

- Construct 8 hiking trails, totaling 16.7 miles. Two of these trails (4 miles total) were approved in the 1996 Davison Ranch development plan but were not constructed because more comprehensive planning for the 1999 GMP began shortly after the Davison Ranch plan was approved.
- Designate 2 off-road bike routes on 10.3 miles of former logging and ranch roads.

Two new trailheads would be constructed

- east of Highway 101 in the Myrtle Avenue/Rudisill Road area north of Wilson Creek in Del Norte County.
- at the A-9 deck along the West Side Access Road on the west side of Redwood Creek in Humboldt County.

Two existing trailheads would be redesigned for safety and to improve pedestrian and vehicle circulation patterns at:

- Lyons Ranch trailhead off Bald Hills Road in Humboldt County.
- Mill Creek Horse Trail trailhead off Howland Hill Road in Del Norte County.

Two new backcountry camps would be constructed at:

- Skunk Cabbage Creek section of the Coastal Trail near the southern end of Gold Bluffs Beach.
- Copper Creek on the southern extension of the East Side Trail.

The existing backcountry equestrian camp at Fortyfour Creek in the Redwood Creek basin would be redesigned for accessibility after being relocated to the G-6-1 Road to improve resource protection, visitor safety, and accessibility for visitors of all abilities, and to provide an adequate stock water source.

All camping in the existing and proposed backcountry camps, equestrian camps and dispersed camping areas in RNSP would require a free permit. Currently, NPS backcountry permits are required only in the Redwood Creek basin, where almost all camping occurs on the gravel bars in the stream channel.

Dispersed camping is currently allowed on gravel bars along of the Redwood Creek, from McArthur Creek upstream to the park boundary except within 0.25 mile on either side of the Tall Trees Grove. After 2009, dispersed camping would no longer be allowed along about 4 miles of the lower Redwood Creek gravel bars from approximately 0.25 mile below the mouth of McArthur Creek upstream to Bond Creek. Dispersed camping on the gravel bars along Redwood Creek would be allowed to continue upstream of Bond Creek to the park boundary, except within 0.25 mile either side of the Tall Trees Grove. This action is part of an on-going study of the relation between visitor use and the numbers of corvids (jays and ravens), which are known to be a predation threat to marbled murrelets. Murrelets are assumed to occupy the old growth forest along this section of the creek. If the study shows no relation between corvid populations and presence of campers, the camping closure might be lifted.

A portion of the West Side Access Road along the national park boundary on the west side of the Redwood Creek basin would be opened to public motor vehicle use. The road would be open from the park boundary at Hilton Road near Orick for 6.5 miles to the proposed A-9 Deck trailhead for access to the equestrian trails and backcountry camps on the west side of Redwood Creek. All roads leading off the A-9 deck would be gated to prevent unauthorized access.

Endangered Species Protection Measures Common to All Alternatives, Including No Action

Work that has the potential to affect listed fish would be implemented under the minimization measures listed in the NPS BA submitted to NMFS (Bensen 2005) and restated in the NMFS BO issued for this plan (NMFS file number ARN # 151422SWR03AR8825, dated September 17, 2007.) The BO also includes non-discretionary terms and conditions to implement reasonable and prudent measures to reduce and monitor injury and mortality to listed salmonids, which are incorporated by reference into this environmental assessment and are designed to minimize incidental take of listed fish.

The NPS has already implemented the conservation recommendation by NMFS included in their BO to minimize or adverse effects on coho salmon from use of the existing Mill Creek Horse Trail which. Since 2005, two creek fords on the existing Mill Creek Horse Trail have been seasonally closed to protect coho salmon and other anadromous salmonids during spawning runs. The southern ford is closed from October 15 to May 31. The northern ford is closed October 15 to May 15.

To reduce impacts on marbled murrelets and northern spotted owls, the NPS has begun to implement the avoidance and minimization measures in compliance with the non-discretionary Terms and Conditions of the USFWS BO issued for this plan (USFWS BO, file number 8-14-2003-1517.) These Terms and Conditions are incorporated by reference into this environmental assessment and are designed to avoid and minimize incidental take of marbled murrelets and northern spotted owls that might otherwise result from the proposed action. The minimization measures primarily address noise restriction periods for marbled murrelets and northern spotted owls.

Cultural Resource Protection Measures Common to All Alternatives, Including No Action

When site-specific design for trail, trail head, and backcountry camps commences, the NPS will consult with the California SHPO and affected American Indian groups, including THPOs as appropriate, in accordance with 36 CFR 800, the implementing regulations of Section 106 of the National Historic Preservation Act (NHPA), to identify any “historic property” eligible for or listed on the NRHP, including but not limited to archeological sites, historic resources, and ethnographic resources or traditional cultural properties that could be directly, indirectly, or adversely affected by a proposed action/undertaking. If any previously unknown archeological or other historic property is discovered, the NPS would determine appropriate measures to protect the resource in consultation with the California SHPO, the public, and affiliated Tribes, in accordance with the implementing regulations in 36 CFR 800.

In addition, the NPS will consult with the Yurok Tribal Heritage Preservation Officer in lieu of the California SHPO in accordance with 36 CFR 800.2(c)(2), for any proposed trail routes that are within the recognized boundary of the Yurok Reservation.

Alternatives, Including the Proposed Action

The no action alternative and the three action alternatives are described in this section. The no action alternative is described first. Those actions common to all the alternatives are described next, followed by the proposals specific to each alternative. Appropriate mitigation for unavoidable impacts and measures to minimize adverse effects to natural and cultural resources under the alternatives are described in the environmental consequences to specific resources.

Alternative A: No Action Alternative

Under this alternative, the trail system and the construction program would remain essentially the same as they were prior to the approval of the 1999 GMP/GP. The trail program would focus on maintenance and rehabilitation of existing trails. New

construction would be limited to the 8.5-mile section of the East Side Trail in the national park between Lady Bird Johnson Grove and the Tall Trees Grove, 4 trails approved in the 1996 Davison Ranch Development Concept Plan (trails V, W, X, Y) and short trails associated with development of major visitor facilities planned in the 1999 GMP/GP.

Trail development and construction would involve relocation of unsafe trail segments rather than construction of major new backcountry trails in areas currently unserved by trails. Short segments of existing trails would be relocated if resources were being damaged or to improve visitor safety.

The existing backcountry camps and trailheads would remain in their present locations and be retrofitted as needed to meet accessibility standards. No new backcountry camps would be constructed.

The East Side Trail between Lady Bird Johnson Grove and the Tall Trees Grove (M^A) would be constructed along the route originally proposed in the 1984 Trail Plan and in the 1999 GMP/GP. This route would run through 8.5 miles of old growth forest from Lady Bird Johnson Grove to join the Emerald Ridge Trail. This alignment of the East Side Trail would be served by existing trailheads at Elk Meadow, Lady Bird Johnson Grove, Tall Trees Grove, and Dolason Prairie. No additional trailheads to serve the East Side Trail would be constructed.

The Davison Ranch trails approved through the 1996 planning process include 4 miles of hiking trails (W, X); 8.3 miles of equestrian trail (Y); and 3.7 miles of a former logging road to be designated as an off-road bike trail (V).

Short fully-accessible interpretive trails might be constructed in conjunction with development of visitor facilities at Hiouchi and Crescent Beach, as proposed in the 1999 GMP/GP. These trails would be subject to site-specific planning and environmental compliance for the larger development. Trails associated with these visitor facilities would remain within developed or front-country management zones identified in the 1999 GMP.

No new trailheads would be constructed under the no action alternative. The existing trailheads at Lady Bird Johnson Grove, the Tall Trees Grove, and Dolason Prairie would serve the East Side Trail. Existing trailheads along the Bald Hills Road or elsewhere might be redesigned or enlarged if visitor demand increased and if funding is available in the future. Under the no action alternative, the existing old road on the east side of Highway 101 would remain the closest parking available for campers at DeMartin Prairie backcountry camp and Coastal Trail hikers in this part of RNSP.

Under the no action alternative, no new backcountry camps would be constructed. Existing backcountry camps and environmental camps for hikers would be retained at Nickel Creek, DeMartin Prairie, and Flint Ridge. Backcountry horse camps at Elam Creek and Little Bald Hills would remain in their present locations and capacities.

There would be no changes to existing policies and regulations governing visitor use in the RNSP backcountry. Dispersed camping would be allowed on the gravel bars in Redwood Creek upstream of McArthur Creek to the park boundary, excluding 0.25 miles either side of the Tall Trees Grove. Free permits would be required for all backcountry overnight use on the main streambed of Redwood Creek and fires on the gravel bars. No other open fires would be permitted, except in park-provided fire rings or grills. NPS backcountry and horse camps would not require permits.

Under the no action alternative, the West Side Access Road (WSAR) would remain closed to public motor vehicle use. No improvements would be made to the WSAR under the no action alternative, other than routine maintenance and repairs.

The Coastal Drive would be converted to a trail if the road failed catastrophically and cannot be repaired to meet motor vehicle safety standards or if resource protection is seriously compromised. If the road fails and is converted to a trail before the proposed Coastal Drive bypass trail (trail K, Alternative C) is constructed, the bypass trail would not be constructed and the Coastal Drive trail would provide a hiking experience in that area of the parks. Road-to-trail conversion involves completely excavation of stream crossings; restoration of original contours and landforms along road corridors by retrieving sidecast fill; uncovering buried topsoil; spreading woody debris on finished surfaces; and replanting with native species if needed to ensure revegetation prior to the onset of the rainy season. A section of the road prism approximately five feet wide is left on the cutbench of the former road to create a stable tread. In addition, armored stream crossing or small footbridges would be installed across streams at the uphill, upstream portion of the former road stream crossing.

Alternatives, Including Proposals Common to All Action Alternatives

This section compares and contrasts those actions that are proposed under the three action alternatives. Alternative B features moderate development of new trails. Alternative C has a recreation focus and includes the most new development of trails. Alternative D, the Proposed Action and environmentally preferred alternative, proposes development with minimal new construction in old growth forest.

The BAs and accompanying biological opinions that describe all required measures to minimize impacts on listed species that have been developed in consultation with the USFWS and NOAA Fisheries under Section 7 of the Endangered Species Act, as amended. Minimization measures are part of the proposed action and are incorporated by reference.

Proposals Common to Action Alternatives B, C and D

Highway 101 Pedestrian Crossings—All action alternatives include proposed trail G that would link the existing segments of the Coastal Trail to inland trails, including the historic Kelsey Trail and the Pacific Crest Trail. Finalizing this trail link requires a pedestrian crossing of Highway 101 between Enderts Beach Road and Hamilton Road.

Highway crossings can be nonstructural or structural. Nonstructural crossings can be designated by painting pedestrian crosswalks on the highway surface such as the crosswalks in Orick or at Trees of Mystery in Klamath. Designated crossing points that use painted crosswalks must have sufficient sight distance in both directions for pedestrians to see vehicles and have sufficient time to cross the highway safely. Structural crossings can use bridges or overpasses similar to the one at Lady Bird Johnson Grove, or underpasses such as culverts used in some state parks on U.S. Highway 101 along the Oregon Coast. Structural crossings are more expensive but safer because pedestrians are separated from motor vehicles traveling at highway speeds. Where structural crossings are indicated as the preferred alternative, non-structural crossings could be used in the interim.

Any pedestrian crossing for Highway 101 requires an encroachment permit from the California Department of Transportation and additional site-specific planning and design, accompanied by environmental compliance documents.

Designation of Bicycle Routes—Any bicycle trails on NPS lands approved through this planning process will be designated through rule-making procedures as required under NPS regulations.

Trail Design and Construction—Lengths of trail segments and acres of disturbance are estimates based on GIS map analyses. All final trail alignments would be determined in the field to account for steepness and grade, drainage patterns, soil type, ground stability, avoidance of sensitive resources, and the presence of obstacles or interesting features such as cliffs, large trees, large rocks, and views.

Trails would be designed and constructed to meet requirements of the Uniform Federal Accessibility Standards and the Americans with Disabilities Act (ADA) to the greatest extent practicable.

Trails would be constructed per NPS guidelines in the 1983 NPS Trails Management Handbook or to standards required under a specific funding source. The trail standards are intended to apply to new trail construction on undisturbed ground. Trails that are converted from logging roads often require different designs or construction techniques. While foot trails on undisturbed ground can be constructed with hand tools or powered hand tools, trails converted from roads generally require heavy equipment to remove or replace culverts or repair drainage structures. Converted trails are usually wider than trails designed specifically for hikers or equestrians because a road bench originally intended for vehicles is wider than a path intended for pedestrians or equestrians.

No large trees of any species would be removed during trail construction. Most vegetation removed for trail construction would be shrubs and saplings. The maximum size of trees to be removed for trail construction would be 18 inches diameter at breast height (dbh) in dense second growth areas where no alternative route exists to avoid an individual tree. The majority of trees removed would be less than 12 inches dbh. More small trees (less than 12 inches dbh) would be removed to construct trails in second

growth coniferous and alder forests because these forests have much denser stands of smaller trees that cannot be avoided as easily as larger trees in old growth forests. Topsoil and duff that is scraped off and placed on the side of a trail under construction contains a native seedbank that allows for rapid, natural revegetation when replaced on top of disturbed soils. Some vegetation removed from a trail corridor, such as sword fern, would be stockpiled along the edge of the trail and replanted for erosion control and to create an attractive trail.

Maintenance of existing trails and repair or relocation of short sections of existing trail to reduce resource damage or to correct visitor safety hazards are also common to the no action and all action alternatives. To maintain an open corridor for safe travel, a vegetation clearance zone of 6-foot-wide by 8-foot-high would be kept open on foot trails while on horse trails a clearance zone of 8-foot-wide by 10-foot-high would be maintained. Trail maintenance depends on adequate funding and personnel to maintain and repair trails if weather and storm events cause trees to fall across trails or to damage trail bridges and trail tread.

Proposed Trailheads Common to Action Alternatives—Locations for proposed trailheads were selected based on the location of proposed trails and whether a proposed trail could be served by an existing trailhead. All proposed trailheads and trailhead improvements require additional planning and design, which would be accompanied by site-specific environmental analysis completed prior to construction.

Under all action alternatives, the NPS proposes to construct a minimum of two trailheads to serve trail users and backcountry campers, and to enlarge or redesign two existing trailheads to address safety and operational concerns, and increase the accessibility of the camps for users of all abilities.

The Wilson Creek trailhead would be located on the east side of Highway 101 north of the mouth of Wilson Creek to serve the existing segment of the Coastal Trail and the DeMartin primitive camp. It would incorporate existing paved roads that formerly served private residences in this area or would be located at Wilson Creek. Campers are presently allowed to park on an old road east of Highway 101 near the DeMartin camp provided their vehicles do not block the gate. However, visitors southbound on the highway must turn left across two lanes of oncoming traffic moving at highway speeds. The turn is difficult to negotiate for visitors arriving from either direction. The nearest existing parking area that could serve as a trailhead is the Wilson Creek picnic area located on the ocean side of Highway 101 opposite the Redwood Youth Hostel. The Wilson Creek trailhead would have a capacity for three recreational vehicles (RVs) and seven passenger vehicles. The proposed new trailhead would be accessed from Wilson Creek Road if the new location does not use the existing abandoned roads.

The A-9 trailhead would be constructed on a former logging deck located along the West Side Access Road. This trailhead would provide a staging area for equestrians and hikers using the west side horse trails and backcountry camps at Fortyfour Creek and Elam

Creek. The A-9 trailhead would have a capacity for 15 RVs or trailers and 15 passenger vehicles.

Trailheads would be furnished with vault toilets, wildlife-proof trash containers, and information kiosks. Trailheads would be large enough to accommodate large vehicles such as RVs except for trailheads located along roads where RVs or trailers are not advised or allowed because of steep grades or sharp curves.

Trailhead Redesign—Under all three action alternatives (alternatives B, C, and D), existing trailheads at the Mill Creek Horse Trail and Lyons Ranch Trail would be enlarged and redesigned to improve safety and operational characteristics.

The Mill Creek Horse Trail trailhead off Bertsch Avenue east of Crescent City in Del Norte County would be redesigned to accommodate horse trailers safely and efficiently. Trailhead redesign would also include consideration of a new access road to the trailhead from Howland Hill Road that avoids residential areas. The Mill Creek Horse trailhead would have a capacity for 15 RVs or trailers and 15 passenger vehicles. The existing Little Bald Hills trailhead on Howland Hill Road would remain open to visitor use but equestrians would be encouraged to use the Mill Creek trailhead that would be designed to accommodate stock trailers and large vehicles.

The Lyons Ranch trailhead along the Bald Hills Road in Humboldt County would be redesigned to improve safety and resource protection. The trailhead would also be enlarged to serve hikers and mountain bikers using proposed Lyons Ranch trails (Q2 under Alternatives B and D; Q1 loop under Alternative C); the Coyote Creek Bike Trail (U) under all alternatives; and the Coyote Creek backcountry bike camp (Alternative C only). The Lyons Ranch trailhead would have a capacity of 10 passenger vehicles.

The present entry to the Lyons Ranch trailhead off the Bald Hills Road would be redesigned to eliminate the sharp steep curve at the Bald Hills Road and to provide better sight distance for vehicles entering and exiting the parking area. Although large vehicles and trailers are not currently recommended on Bald Hills Road, the parking area might be designed for access by large vehicles to account for future improvements to the Bald Hills Road. If possible, the parking area would be located below the ridge top to reduce the visibility of the trailhead from the Bald Hills Road. Moving the parking area would increase protection of cultural resources in the Bald Hills Archeological District.

Backcountry Camps—A total of five new backcountry (primitive) camps with a total of 24 campsites are considered under the action alternatives (B, C, and D). Under Alternative B, four camps (19 sites altogether) would be constructed. The proposed camps would be located along the Coastal Trail near Skunk Cabbage Creek (4 sites), and within easy hiking distance of the East Side Trail (M^B, M^C) at Miller Creek (6 sites), Copper Creek (5 sites), and Counts Hill Prairie (4 sites). Under Alternative C, the four camps mentioned above would be constructed along with a fifth camp with five campsites available to mountain bicyclists in the Coyote Creek area along the roads proposed for designation as the Coyote Creek Bike Trail (trail U). Although the bike

route is proposed under all three action alternatives, the proposed camp would be constructed only under Alternative C. Under Alternative D (the proposed action), the Skunk Cabbage and Copper Creek camps would be constructed.

Two camps, one on the Skunk Cabbage section of the Coastal Trail and one at Copper Creek, would be constructed under all action alternatives including the proposed action.

The Skunk Cabbage camp with 4 campsites is proposed along the Skunk Cabbage section of the Coastal Trail south of Gold Bluffs Beach, approximately 0.4 miles south of the point where the Coastal Trail turns inland into the forest. This camp would be in Sitka spruce forest set back from the coastal bluffs.

The Copper Creek camp would be constructed near the mouth of Copper Creek along the extension of the East Side Trail (M^B). It would have 5 sites.

Backcountry camp locations were selected based on reasonable proximity to existing or proposed trails, the availability of potable or treatable water within a reasonable walking distance of the camp, sufficient level ground with stable soils suitable for construction and far enough from a water source to meet sanitation standards for pit toilets, and vegetation to provide shade during hot summer months and to provide an esthetically pleasing experience. Where a trail would be long enough to offer more than one day's hike, such as the Coastal Trail or the East Side Trail, proposed locations were chosen to be within an easy day's hike from a trailhead or another camp.

Under all action alternatives, the Fortyfour Creek equestrian camp would be relocated to the G-6-1 road and redesigned to be barrier-free to the greatest extent possible given site constraints such as topography and the distance from water sources needed to comply with sanitation codes. The original water source for the camp was eliminated when an abandoned road was removed for watershed restoration. The proposed location would provide an adequate water source for stock.

West Side Access Road—Under all action alternatives, the West Side Access Road (WSAR) would be opened to the public when the proposed A-9 trailhead is completed. The action alternatives differ in whether the WSAR is open to the public past the A-9 deck. Under Alternatives B and D, about five miles of the WSAR within the park would be open to the public; no public motor vehicle use would be permitted beyond the A-9 deck. Under Alternative C, public motor vehicle use would be permitted for as much as an additional 10 miles beyond the A-9 deck for access to a dispersed camping area and two other trailheads proposed under Alternative C. These two trailheads would be located at the B-5-2 road and about a mile east of the junction of the WSAR and Rodgers Peak road. No stock trailers would be allowed on the WSAR beyond the A-9 trailhead under any alternative.

Proposed Changes to Backcountry Use Regulations

Changes in backcountry management proposed in this plan include permit requirements for backcountry camping, limits on numbers of campers at camps, definition of party size limits, and designation of additional backcountry camping areas. Some aspects of backcountry management are covered by state or Federal regulations, including campfires, livestock and pets, food storage, sanitation and refuse, wildlife protection, and closures of areas of the parks for safety or resource protection.

Regulations governing use of the RNSP backcountry are found in the Code of Federal Regulations, Titles 14 and 36 (14 CFR & 36 CFR). These general regulations apply to all national parks.

Regulations specific to Redwood National Park are found in the Superintendent's Compendium of Designations, Closures, Permit Requirements, and other Restrictions. The Compendium provides park-specific details that expand upon general regulations found in the CFRs. Park-specific regulations describe areas open to backcountry camping and overnight parking, numbers of sites and lengths of stay allowed in camps, backcountry permit requirements, food storage techniques to keep wildlife from obtaining and consuming human food, noise levels allowed in old-growth forest, campfires, sanitation, pets, requirements for stock use, and designated off-road bicycle routes.

Any changes to current regulations needed to implement proposals described in this plan would be subject to federal and NPS rule-making procedures. These procedures include publication of proposed changes in the Federal Register and amending the Redwood National Park compendium.

Backcountry Camping Permits—Under both action alternatives, the NPS proposes to require free permits on a first-come, first-served basis for all overnight camping in RNSP backcountry and horse camps, in the Redwood Creek corridor where camping is allowed. Permits would also be required for the dispersed camping area on the west side of Redwood Creek under Alternative C only. Backcountry camping permits would be available at all visitor contact facilities including campgrounds and visitor centers, and via self-registration at trailheads. Visitors holding valid backcountry permits would be allowed to park overnight at designated trailheads. A reservation system might be instituted in the future if demand for campsites consistently exceeds campsite availability and if first-come, first-served backcountry camping compromises resource protection and visitor safety. Under the current management (no action alternative), free permits are required for camping along the gravel bars of Redwood Creek but not for camping in the NPS backcountry camps, including the equestrian camps.

No overnight camping would be allowed at trailheads, except where signs indicate that overnight parking is allowed. Overnight parking at certain trailheads would be allowed only for persons holding valid backcountry camping permits.

Dispersed Camping—Dispersed camping means that campers can choose their own campsites rather than being required to camp in designated campsites in established camps. Under Alternatives A, B, and C, dispersed camping would continue to be allowed upstream of McArthur Creek to the park boundary, excluding 0.25 mile on either side of the Tall Trees Grove. Under Alternative D, dispersed camping would not be permitted for four miles along the gravel bars of lower Redwood Creek between McArthur Creek and Bond Creek after 2009. Dispersed camping on the gravel bars would continue to be allowed to continue from Bond Creek upstream to the park boundary, excluding 0.25 mile on either side of the Tall Trees Grove. There is essentially no area suitable for camping in the stream channel upstream of Rocky Gap (about one mile upstream of the mouth of Bridge Creek). Under Alternatives A, B, and C, about 9.25 miles of the Redwood Creek channel would be open and suitable for dispersed camping, versus about 5.75 miles under Alternative D.

Under Alternative C, a dispersed camping area is proposed on the west side of Redwood Creek in the Tom McDonald Creek, Bridge Creek, and Devil's Creek watersheds. The dispersed camping area is bounded roughly on the east by Redwood Creek to the east, on the west and south by the park boundary, and on the north by the Fortyfour Creek horse trail loop (originally called the Three Day loop).

In dispersed camping areas, regulations prohibit camping within sight of a trail or road; within 50 feet of water sources (except on Redwood Creek gravel bars); within sight of other camping parties; or within 0.25 mile of a trailhead, the park boundary, or the Tall Trees Grove. No change to these regulations is proposed.

Public Use Limits—The NPS proposes to establish party size limits for resource protection and to enhance the backcountry experience for all campers. No more than eight persons would be allowed to camp together as a party in either the dispersed camping areas on the Redwood Creek gravel bars, or in a single site at any of the backcountry camps, except at designated group camps. A party is defined as individuals who share a common itinerary and who cook, eat or socialize together throughout their trip. The dispersed camping areas would not be designated for group camping. Permits would not be issued for more than 50 persons per night in the dispersed camping areas along Redwood Creek. A party is not permitted to camp within sight of another camping party. The party size at designated group sites in the camps in Little Bald Hills and on the west side of Redwood Creek would be limited to 20 people.

Campfires—Under current regulations, campfires are permitted in the backcountry in park-provided grills or designated sites in all backcountry campsites. Holders of valid backcountry camping permits for Redwood Creek may build small fires only on gravel bars. No campfires would be permitted in other dispersed camping areas. Open fires are prohibited during times of high fire danger when posted in accordance with the RNSP Fire Management Plan. No other fires are permitted in the RNSP backcountry. No change to these regulations is proposed.

Future Conservation Planning, Consultations and Other Requirements

Proposed actions under any of the alternatives that have the potential to affect certain resources or that would occur in certain areas might require consultation, permits, or concurrence from another agency or group, in compliance with specific laws, policies, or agreements. These resources include but are not limited to water quality; wetlands; rare, threatened or endangered species; and significant cultural resources.

All trailheads would require additional site-specific planning and design prior to construction. Surveys for rare plants and cultural resources would be completed prior to construction as part of the site-specific design.

Actions that would occur within the Coastal Zone, inside the boundaries of the Yurok Reservation, or in other areas of concern to the Yurok Tribe or other American Indian groups would require concurrence or consultation with the appropriate agency or group. All required consultations, concurrences, or permits would be obtained as part of the design process and prior to initiation of construction.

All or parts of several proposed trails are within or near the California Coastal Zone (G, H, I, J, K, O, R, and Y). Federal lands are excluded from the Coastal Zone permitting process but projects on federal lands are subject to the federal consistency review to determine whether the project is consistent to the maximum extent practicable with the California Coastal Management Program. The NPS would prepare consistency determinations for Coastal Commission review when site-specific designs become available. The Crescent Beach loop (H), portions of the Flint Ridge Loops (I, J), the Coastal Drive bypass trail (K), the Redwood Creek Nature Trail (O), the Gyon Bluffs trail (R), the proposed Skunk Cabbage backcountry camp, and the proposed trailhead near Wilson Creek are subject to federal consistency review by the Coastal Commission.

Routes Proposed for Designation for Bicycle or Off-Road Bicycle Use—NPS general regulations found in Title 36 of the Code of Federal Regulations (36 CFR) require that routes other than park roads may only be designated for bicycle use based on a written determination that such use is consistent with the protection of the park's natural, scenic and aesthetic values, safety considerations, and management objectives, and that designation of bike routes will not disturb wildlife or park resources (36 CFR 4.30 (a)).

This plan and the accompanying environmental assessment describe effects of designating bike routes on the resources. This analysis meets the criteria for a written determination specified in the regulation. If it is determined, after any required consultation with agencies and American Indian groups and consideration of public comments on this plan, that the proposed bike routes would meet the criteria specified in the regulation, the NPS would initiate the process of promulgating the special regulation for designating bicycle routes (36 CFR 4.30 (b)). Should the superintendent determine that the bike routes proposed in this plan would not have significant adverse impacts on park resources and values or public safety, the finding of no significant impact will constitute the written determination required by the regulation.

Designation of bicycle routes (trails) under 36 CFR 4.30 (a) and (b) requires written determinations and formal rulemaking for trails outside of developed areas and special use zones. Upon completion of this trail plan, if bicycle routes are found to be consistent with resource protection, the NPS would proceed with rulemaking, using the environmental assessment accompanying this plan to support the proposed bicycle route designations.

Alternative B: Moderate Development

Alternative B Trails—Under Alternative B, 10 hiking trails totaling 24 miles would be constructed. Two hiking trails that were approved in the 1996 Davison Ranch development plan are included in these totals. About 10.3 miles of former logging and ranch roads would be converted to two mountain bike trails.

The following hiking trails would be constructed under Alternative B.

A. Hiouchi Flat Trail, ADA-accessible, 1.1 miles. This trail skirts the north bank of the Smith River to connect Jedediah Smith Redwoods State Park campground with the Hiouchi commercial area. This trail might be constructed in conjunction with a proposed NPS-CDPR visitor center at Hiouchi Flat across Highway 199 from the existing NPS information center. No specific trailheads have been proposed to serve this trail. If the trail is constructed as part of a larger construction project, a trailhead might be incorporated into the larger project.

G. Rellim Ridge-Coastal Trail connector, 1.7 miles. This trail creates a connection between inland trails and the California Coastal Trail at Crescent Beach. This is one of several proposed segments needed to link the Coastal Trail to the Pacific Crest Trail. A pedestrian crossing of Highway 101 would be established at the western end of this trail somewhere between Hamilton Road and Enderts Beach Road. The exact route of the trail would depend on whether a safe pedestrian crossing of Highway 101 can be established.

H. Crescent Beach Hiking Loop, ADA-accessible, 0.7 mile. This trail creates a short, fully accessible interpretive loop in the Crescent Beach visitor use area. A boardwalk would raise the trail above the wetlands in the area and allow on-site interpretation of coastal wetlands and other coastal resources and processes. This trail would most likely be constructed in conjunction with redesign of the existing Crescent Beach picnic area, which would serve as the trailhead. The existing segment of the California Coastal Trail at Crescent Beach would be incorporated to create the loop from the picnic area.

M^B. East Side Trail, hiking, 12.9 miles. This version of the East Side Trail includes the trail route between Orick and the Tall Trees Grove mentioned in the Redwood National Park 1978 expansion legislation. The trail would originate at the Bald Hills Road near Lady Bird Johnson Grove, and run mostly through old-growth redwood forest along the east side of the Redwood Creek basin. This route includes an extension of the trail beyond the Tall Trees Grove along the east side of Redwood Creek to connect with the

proposed Lyons Ranch hiking trail (Q2 under this alternative) in the Copper Creek basin near the southern boundary of the national park. The completed trail would incorporate portions of the existing Tall Trees, Dolason, and Emerald Ridge trails.

O. Redwood Creek Beach Nature Trail, ADA-accessible, 0.4 miles. This short interpretive trail would be a fully accessible boardwalk trail connecting the Redwood Information Center with the Redwood Creek Picnic Area. It would be part of the California Coastal Trail. The information center and the picnic area would serve as trailheads.

P. Whiskey 40 Interpretive Trail, 1.0 mile. This trail creates an interpretive loop through the Whiskey 40 area and Gann's Prairie. It would connect with the East Side Trail and provide access to the East Side Trail from the Bald Hills Road. A proposed trailhead here would also serve East Side Trail hikers and backcountry campers using the camps along the East Side Trail. A Whiskey 40 trailhead would also provide overflow parking for Lady Bird Johnson Grove, which would be reached by a short hike along the East Side Trail segment between the Whiskey 40 and the grove parking area.

Q2. Lyons Ranch Trail, 1.7 miles. This trail would connect the East Side Trail extension at the proposed Copper Creek backcountry camp to the Bald Hills Road by constructing a new segment between the camp and the existing Lyons Ranch Road. This trail would use the existing Lyons Ranch trailhead off the Bald Hills Road. Under Alternative C only, an additional segment of this trail would be constructed between the trailhead and the East Side Trail extension to create a loop trail (Q1).

R. Gyon Bluff segment of the California Coastal Trail, 0.5 mile. This short trail would connect Freshwater Spit with Stone Lagoon in Humboldt Lagoons State Park. This trail would be a segment of the California Coastal Trail.

Two hiking trails approved in 1996 through the planning process for Davison Ranch developments are also included in Alternative B.

W. Berry Glen Trail, 2.1 miles. This trail would connect the Davison Trail and other trails originating at the Elk Meadow Trailhead with the Lady Bird Johnson (LBJ) Grove trail and the East Side Trail (M^B). The Berry Glen Trail begins at Highway 101 at the southern end of the Berry Glen-Lost Man Creek Bike Trail and ascends the slope below Lady Bird Johnson Grove to meet the existing LBJ Grove trail. This trail in combination with proposed trail X described below would create a link between the California Coastal Trail and the East Side Trail (M^B).

X. Skunk Cabbage North Trail, 1.9 miles. The trail would run along the north side of Skunk Cabbage Creek to meet the existing Skunk Cabbage Trail, which is a segment of the Coastal Trail. The Skunk Cabbage North trail and the Berry Glen trail (W) to the Lady Bird Johnson Grove trail would be the links between the East Side Trail and the Coastal Trail. The Skunk Cabbage North trail would connect to the Trillium Falls Trail with the existing Skunk Cabbage segment of the Coastal Trail where it crosses the

headwaters of Skunk Cabbage Creek. This new configuration would allow the Elk Meadow trailhead to serve as the primary trailhead for the Coastal Trail in this area and reduce the safety hazard for vehicles trying to turn left across Highway 101 at the 35-mile-per-hour curve at Robinson Road. The existing Robinson Road trailhead would be retained for additional access to the Coastal Trail.

Two roads formerly used for logging or ranching are proposed for designation as bike routes under Alternative B.

L. B-Line Bike Trail, mountain bike, 4.5 miles one-way. This road skirts the boundary of the national park in the Lost Man Creek watershed. The B-Line bike route would begin on the eastern park boundary where the existing Holter Ridge Bike Trail turns east and south, and would follow the former Simpson Timber Company B-Line [not the former Louisiana-Pacific B-Line west of Redwood Creek] along the park boundary where the Highway 101 bypass intersects with the old Cal-Barrel Road. Because of the safety and construction issues associated with establishing a trailhead in the vicinity of a controlled-access freeway, this route would not be a loop trail. The Lost Man Creek trailhead would serve as the trailhead for the B-Line bike trail.

U. Coyote Creek Bike Trail, mountain bike, 5.8 miles. Ranch Road, Rock Fork Road, and Lower Rock Fork Road in the Coyote Creek watershed would be designated as a bike route in the Bald Hills area of the park. Bicyclists would travel on the Bald Hills Road to return to the existing Lyons Ranch Trailhead for a bike loop.

Alternative B Trailheads—Under Alternative B, three new trailheads would be constructed at the following locations to serve existing or proposed trails. In addition to the Wilson Creek and A-9 trailheads already described, an additional trailhead would be constructed under Alternative B.

The Whiskey 40 trailhead along the Bald Hills Road in the Whiskey 40 area to serve the proposed Whiskey 40 trail (P). A segment of the East Side Trail (M^B) would connect Lady Bird Johnson Grove parking to the proposed Whiskey 40 trailhead. This trailhead would also serve as overflow parking for Lady Bird Johnson Grove or for visitors seeking a slightly longer hike than that currently available from the existing Lady Bird Johnson Grove parking area. The Whiskey 40 trailhead would have a capacity of 10-15 passenger vehicles. Because motorhomes and trailers are not advised on the Bald Hills Road due to steep grades and sharp curves, the trailhead would not be designed to accommodate large vehicles.

Alternative B Backcountry Camps—Four backcountry camps with a total of 19 campsites would be constructed under Alternative B. The Skunk Cabbage and Copper Creek camps were described under backcountry camps common to the action alternatives. Two additional camps would be constructed under Alternative B.

The Miller Creek camp (6 sites) would be located at Miller Creek on an old log landing near old-growth redwood forest.

The Counts Hill Prairie camp with 4 sites would be located at the bottom of Counts Hill Prairie between Airstrip and Slide creeks.

Alternative B Dispersed Camping—Under Alternative B, dispersed camping would be allowed to continue along the Redwood Creek gravel bars from McArthur Creek upstream to the park boundary, with the exception of 0.25 mile on either side of the Tall Trees Grove.

Alternative B West Side Access Road—Under Alternative B, the WSAR would be open to public motor vehicle use as far as the A-9 deck trailhead.

Alternative C: Recreation Focus

Alternative C Trails—Under Alternative C, 15 hiking trails totaling 49.7 miles would be constructed. Two of these trails were approved in the 1996 Davison Ranch Development Concept Plan. An 8.3-mile equestrian trail approved in the Davison Ranch plan would also be constructed. Almost 14 miles of former logging and ranch roads would be designated for three mountain bike trails. One of the bike routes (V) was approved through the Davison plan but has not yet been converted to a trail and designated under NPS regulations.

The East Side Trail (M^C) and the Lyons Ranch Trail (Q1) have different alignments under Alternative C compared to other alternatives. Alignment M^C under Alternative C is 12.8 miles in length. Under Alternative B, M^B is 12.9 miles long. Both M^B and M^C begin at Lady Bird Johnson Grove, meet existing trails at Tall Trees Grove, Emerald Ridge, and Dolason Prairie, and join the Lyons Ranch Trail (Q) near Coyote Creek.

More of the Alternative C alignment for the East Side Trail (M^C) passes through old growth forest (10.3 miles under Alternative C) than under Alternatives B (8.6 miles) or D (6 miles in or adjacent to old growth). The Lyons Ranch Trail under Alternative C (Q1) is a loop trail that is more than twice as long as the non-loop version (Q2). Q1 is a 3.8 mile-long loop under Alternative C. Under Alternatives B and D, trail Q2 is 1.7 miles long.

The five hiking trails listed below (I, J, K, S and T) are unique to Alternative C. The routes for the other 11 trails were described under Alternative B.

I. Flint Ridge Loop West, 0.9 mile. In conjunction with the Flint Ridge Loop East (J, below) and the central part of the existing Flint Ridge Trail, this trail would create a loop route on Flint Ridge south of the Klamath River. A proposed trailhead at the junction of Alder Camp Road and Coastal Drive would serve the loop trail.

J. Flint Ridge Loop East, 1.7 miles. This trail would create a hiking loop in conjunction with proposed Flint Ridge Loop West (I, above) and a portion of the existing Flint Ridge Trail. A proposed trailhead at the junction of Alder Camp Road and Coastal Drive would serve the loop trail.

K. Coastal Drive Bypass Trail, 3.4 miles. This trail would create a hiking route parallel to the Coastal Drive between High Bluff Overlook and the northernmost trailhead for the Coastal Trail in Prairie Creek Redwoods State Park. This bypass trail would be a segment of the California Coastal Trail. The existing parking area at High Bluff Overlook or the proposed Alder Camp Road/Coastal Drive trailhead would serve this trail.

S. Tom McDonald Creek Loop, 3.5 miles. This route creates a loop trail in the Tom McDonald Creek area on the west side of Redwood Creek, with low-water access across Redwood Creek to the Tall Trees Grove and Emerald Ridge trails. This trail would originate at the proposed trailhead north of the [former Louisiana-Pacific] B-5-2 road on the west side of Redwood Creek. The first part of the trail would be a one-way route leading to a loop that runs along Redwood Creek across from the Tall Trees Grove. This trail provides access to the proposed dispersed camping area and would connect with the Bridge Creek Trail (T) described below.

T. Bridge Creek Trail, hiking, 14.2 miles. This trail creates a hiking loop for access to the Bridge Creek basin and the proposed dispersed primitive camping area. Two new trailheads to serve this trail are proposed near the junction of the [former Louisiana-Pacific] B-Line and the Rodgers Peak access road. This trail would originate at the proposed trailhead on the West Side Access Road near Rodgers Peak Road. Like the Tom McDonald Creek loop (S) above, this trail includes a one-way section leading to a loop along Bridge Ridge and Bridge Creek.

Alternative C also includes the two bike trails (L, U) described under Alternative B, and the Skunk Cabbage Ridge mountain bike route (V) and the Davison Ranch Equestrian Loop trail (Y) originally approved through the Davison Ranch Development Concept Plan and described below.

V. Skunk Cabbage Ridge mountain bike loop, 3.7 miles. This loop trail would originate at the Elk Meadow trailhead and follow former logging roads around Skunk Cabbage Hill.

Y. Davison Ranch Equestrian Loop, 8.3 miles. This trail would originate from the Davison Ranch horse barn near the Elk Meadow trailhead and circle Skunk Cabbage Hill on former logging roads. The conceptual planning for this loop trail incorporated portions of the 210 and 220 roads, which were removed in 1996 under the watershed restoration program. Construction of the equestrian loop would require further planning to locate a suitable route using portions of logging roads and skid trails that have not been rehabilitated under the RNSP watershed restoration program.

Alternative C Trailheads—Under Alternative C, seven new trailheads would be constructed to serve proposed trails. The Wilson Creek, A-9 deck, and Whiskey 40 trailheads were described above. The four additional trailheads listed below are proposed only under Alternative C.

The Coastal Drive trailhead at the junction of Alder Camp Road and Coastal Drive would serve the proposed Flint Ridge loop trails (I, J) and Coastal Drive Bypass Trail (K). There is an existing parking area at High Bluff that could serve the Flint Ridge loop but hikers would have to walk along Coastal Drive to reach the loop trails. Coastal Drive is a narrow unpaved motor vehicle road without shoulders or areas where hikers could step out of the traffic lane to let vehicles pass.

The Coyote Creek trailhead off the Bald Hills Road at the junction of the Coyote Peak and Rock Fork roads would serve the proposed Coyote Creek bike trail (trail U). An alternative location for this trailhead is along the Bald Hills Road at the junction with Coyote Peak Road. A new trailhead at Coyote Creek would provide additional parking and another access point for the mountain bike trail. It would be closer to the proposed Coyote Creek bike camp than the existing Lyons Ranch trailhead, which is located about 2.5 miles to the northwest off the Bald Hills Road near the junction of Lyons Ranch Road and Long Ridge Road. Long Ridge Road would be designated as part of the Coyote Creek mountain bike trail (U). This trailhead would accommodate at least five vehicles, based on the number of campsites at the proposed Coyote Creek backcountry camp. Large recreational vehicles and trailers are not recommended on Bald Hills Road, so the parking area probably would not be designed to accommodate large vehicles.

A trailhead north of the B-5-2 Road on the west side of Redwood Creek, between the A-9 deck and Rodgers Peak access road, would serve the proposed Tom McDonald Creek Trail (S) and provide access to the proposed dispersed camping area. This trailhead would be about eight miles from the A-9 Deck trailhead.

A Rodgers Peak/WSAR trailhead on the west side of Redwood Creek would be located along the West Side Access Road about a mile east of the junction of the WSAR and the Rodgers Peak Road. The trailhead would serve the proposed Tom McDonald Creek (S) and Bridge Creek (T) trails and the proposed dispersed camping area. This trailhead would be about 9.8 miles from the A-9 Deck trailhead.

Alternative C Backcountry Camps—Five backcountry camps with a total of 24 campsites would be constructed under Alternative C. The proposed camps at Skunk Cabbage along the Coastal Trail and the Miller Creek, Counts Hill Prairie, and Copper Creek camps along the East Side Trail were described above.

The Coyote Creek bike camp with five sites would be established only under Alternative C. This camp would be located on Lower Rock Fork Road along the proposed Coyote Creek bike trail (U). The proposed trailhead at Coyote Peak Road would be the nearest trailhead but bikers and hikers could also use the existing Lyons Ranch trailhead for access to the proposed camp.

Alternative C Dispersed Camping—Under Alternative C, dispersed camping would be allowed to continue along the Redwood Creek gravel bars from McArthur Creek

upstream to the park boundary, with the exception of 0.25 mile on either side of the Tall Trees Grove.

Under Alternative C only, a dispersed camping area would be established on the west side of Redwood Creek in the Tom McDonald Creek, Bridge Creek, and Devil's Creek watersheds. The dispersed camping area is bounded roughly on the east by Redwood Creek to the east, on the west and south by the park boundary, and on the north by the Fortyfour Creek Loop horse trail (formerly the Three Day loop). Two trails proposed only under Alternative C (S-Tom McDonald Creek, T-Bridge Creek) would provide access to the dispersed camping area.

Alternative C West Side Access Road—Under Alternative C, about 15 miles of the WSAR would be open to public motor vehicles for access to the west side of Redwood Creek including all three proposed trailheads (A-9 Deck equestrian, B-5-2 Road, and WSAR near Rodgers Peak Road), the associated trails (Tom McDonald Creek Trail S, Bridge Creek Trail T), and the dispersed camping area. No stock trailers would be allowed on the WSAR beyond the A-9 trailhead under any alternative.

Alternative D: The Proposed Action (NPS Preferred Alternative)

Under Alternative D, the NPS would construct 8 hiking trails totaling 16.7 miles. Two of the eight hiking trails were approved in the 1996 Davison Ranch Development Concept Plan. Two new mountain bike routes would be designated on 10.3 miles of former logging and ranch roads. No new equestrian trails would be constructed in the national park although existing segments of old roads in the northern parts of the park might be re-opened as equestrian trails.

All trails to be constructed or designated; trailheads to be constructed, relocated or redesigned; proposals for backcountry permits; and public use of the West Side Access Road under the proposed action have already been described and are summarized below. Any differences between the proposed action and other alternatives are identified.

Under the proposed action, the East Side Trail (M^D) would begin at the existing Emerald Ridge Trail and join the proposed Lyons Ranch Trail (Q2).

Under Alternative D, the NPS would construct new trailheads at Wilson Creek in Del Norte County and at the A-9 Deck in Humboldt County.

Two backcountry camps with 9 campsites altogether would be constructed under Alternative D along the Coastal Trail at Skunk Cabbage Creek and at Copper Creek along the proposed route of the East Side Trail.

Under Alternative D, the WSAR would be open to public motor vehicle use as far as the proposed trailhead at the A-9 deck. No stock trailers would be allowed on the WSAR beyond the A-9 trailhead under any alternative.

Dispersed Camping on Redwood Creek Gravel Bars—Under Alternative D only, dispersed camping on the gravel bars in Redwood Creek would not be permitted along the lower 4 linear miles of Redwood Creek (McArthur Creek to Bond Creek) after 2009 as part of a study to monitor the relation between corvid abundance and camping on the gravel bars. Under the proposed action, camping would continue to be allowed upstream of Bond Creek as far as the park boundary (except for the 0.25 mile Tall Trees Grove restriction). Under Alternatives A (no action), B and C, dispersed camping on the Redwood Creek gravel bars is allowed upstream of McArthur Creek to the park boundary, except within 0.25 mile on either side of the Tall Trees Grove. Most camping presently occurs from McArthur Creek to about a mile above the mouth of Bridge Creek, a distance of about 9¼ miles.

Other Alternatives Considered

Redesign the Little Bald Hills Trailhead—A proposal to redesign and enlarge the Little Bald Hills trailhead in Jedediah Smith Redwoods State Park to accommodate horse trailers was considered but rejected in favor of the proposed redesign of the Mill Creek Horse Trailhead. Redesigning and enlarging the Little Bald Hills trailhead for easier access by large vehicles would adversely affect old-growth forest and large redwood trees. The Mill Creek Horse Trailhead is located in a previously disturbed area outside of old-growth redwood forest. It has more convenient access by paved road and is easier and safer to negotiate with a stock trailer than the Little Bald Hills trailhead off Howland Hill Road, a narrow winding unpaved road through old-growth redwood forest.

Construct a Fully Accessible Camp near the Redwood Creek Trailhead—A proposal to construct a fully accessible camp downstream of the creek crossing nearest the end of the lower Redwood Creek Trail was considered. This proposal was rejected because there was no site level enough to provide accessible toilets while being far enough from the creek to meet sanitation codes. North Coast Region Water Quality Control Board standards and Humboldt County sewage disposal regulations for on-site sewage disposal systems require a setback of at least 100 feet from a perennial stream, measured from the edge of the ten-year floodplain. Areas far enough from the creek to comply with water quality standards are too steep to meet accessibility standards.

Relocate the Nickel Creek Backcountry Camp—The Nickel Creek backcountry camp is within easy walking distance of the trailhead and attracts users who engage in inappropriate uses and activities inconsistent with intended use of the area as a trail and backcountry camp. Some users camp illegally along the trail between the trailhead and the camp. People camping illegally on the beach near Nickel Creek intrude on interpretive programs conducted on the beach. This camp with five sites receives the highest annual average number of overnight stays of any NPS backcountry camp. About 1000 overnight stays per year were recorded at this camp between 1998 and 2001, with an average of about 200 stays per campsite. The Nickel Creek camp was moved to its current location in 1980 from a nearby location that is an archeological site listed on the National Register of Historic Places. The site is subject to adverse effects from looters and illegal camping. Resource damage attributable to illegal activity was reduced by the

first relocation but continues. A proposal to relocate the camp a second time to a point along the Coastal Trail about one mile south of its existing location was considered. The proposed new location did not meet the criteria used to select sites for new backcountry camps. The closest available location with relatively level ground on which to construct campsites would not provide a high quality backcountry camping experience due to lack of a water source and poor esthetic surroundings in second growth forest. It was determined that it would be more cost-effective to provide additional law enforcement patrols of the existing location and to protect the site using structural techniques than to relocate the camp a second time.

Backcountry Camping without Permits—An alternative in which permits would not be required for overnight use in the backcountry was considered but rejected based on concerns about safety and resource protection. Requiring permits provides a margin of safety for visitors. Permits allow rangers to locate campers more easily in case of emergency or if search or rescue are needed, to determine if vehicles parked overnight at trailheads belong to campers, to provide information on the relationship between visitor use and resource impacts, and to inform campers if a backcountry camp is already full. Permits allow the NPS and C DPR to monitor use levels to determine if demand is high enough to warrant additional camping facilities and to compare the number of campers with the degree of impact at camps.

Dispersed Camping Fire Permits—Allowing ground fires by permit in the dispersed camping area proposed under Alternative C was considered but rejected because of the risk of wildfire from uncontrolled campfires.

Environmentally Preferred Alternative

The environmentally preferred alternative is the action that best promotes the environmental policies outlined in the NEPA statute. These policies include fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations; attaining the widest range of beneficial uses of the environment without degradation or risk to health or safety; and preserving important historic, cultural, and natural aspects of our national heritage.

Alternative D, the proposed action and NPS preferred alternative, is the environmentally preferred alternative because it would have the fewest new adverse impacts to significant natural resources in the national park.

Although Alternative A, the no action alternative, would have the least new construction, the East Side Trail alignment under the no action alternative would pass entirely through an undisturbed section of old growth redwood forest that has no existing visitor use. Construction, use and maintenance of a new trail through old growth forest would result in visual disturbance to two federally listed threatened species (marbled murrelets and northern spotted owls) and to a federal candidate species (Pacific fisher). The presence of humans would also increase the potential to attract avian predators (jays and ravens) that are known to prey on marbled murrelets. The no action alternative also includes

construction of an equestrian trail (Y) and a mountain bike loop trail (V) in the Davison Ranch area of the national park that would not be constructed under the proposed action. Use of the equestrian trail would require that an additional trailhead be constructed at Davison Ranch or that equestrians use the existing Elk Meadow trailhead. The Elk Meadow trailhead was not designed for equestrian use and has no facilities for cleaning up livestock waste which other trailhead users might find objectionable. In addition, livestock use in the area would be a potential source of invasive exotic plants. Therefore, Alternative A, no action, is not the environmentally preferred alternative because of adverse effects to listed threatened species from new construction and visitor use in old growth forests and introduction of livestock into an area of the park where there is currently no livestock use.

Alternative B is not the environmentally preferred alternative because it includes construction of approximately 8.6 miles of a portion of the East Side Trail (M) through old growth redwood forest. Alternative C is not the environmentally preferred alternative because of construction of approximately 10.3 miles of the East Side Trail (M) through old growth redwood forest and an additional 3.6 miles through old growth as part of a 14-mile-long trail in Bridge Creek (T). Alternatives B and C both include construction of a short loop trail through an additional three-quarters of a mile of old growth (Whiskey 40 Trail P) and an associated trailhead. Construction of these trails would create noise and disturbance in undeveloped old growth. The Whiskey 40 Trailhead would increase the risk of attracting avian predators into suitable marbled murrelet and northern spotted owl habitat adjacent to the trailhead.

Alternatives B and C also include development of four and five backcountry camps, respectively. One of these camps along the proposed East Side Trail would be located adjacent to old growth forest, which would increase the predation risk to murrelets by attracting nest predators that have learned to associate humans with food.

Alternative C would also permit dispersed camping on the west side of Redwood Creek, which would further increase human presence in old growth areas, and would allow visitor use along the West Side Access Road for an additional 9.8 miles for access to two trailheads that would serve trails S and T. Increased vehicle access generally results in additional human food and garbage at trailheads, which would increase populations of avian predators and thus increase the risk of predation to threatened birds.

Alternative C also includes construction of the Skunk Cabbage equestrian trail (Y), with the associated impacts from livestock use that were discussed above for Alternative A (no action).

Because of impacts to threatened bird species from new development, maintenance and use of visitor facilities in or adjacent to old growth forest, Alternatives B and C are not environmentally preferred alternatives.

Alternative D, the proposed action, is the environmentally preferred alternative because it has the least development in or adjacent to old growth redwood forest, and would

minimize noise, visual disturbance, and increased risk of predation to threatened marbled murrelets and northern spotted owls that occupy old growth forest.

Affected Environment

Climate and Air Quality—Redwood National and State Parks have a temperate maritime climate influenced primarily by the Pacific Ocean. The parks have wet, mild winters and relatively dry summers with frequent coastal fog. Most precipitation falls as rain between November and April, with infrequent snow that does not persist even at higher elevations inland. Average rainfall varies from about 60 inches near Orick to over 100 inches along the Smith River near Hiouchi in the northern part of the parks. Winter storms from the Pacific Ocean may bring intense rainfall and high winds. Temperatures along the coast vary only slightly between winter and summer. Inland areas such as the Bald Hills experience a greater annual range of temperatures. Mean temperatures in Prairie Creek Redwoods State Park are 47°F. in January and 59°F. in June.

Redwood National Park is designated a Class I air quality area pursuant to the Clean Air Act, as amended. State park lands within the national park boundary are designated as class II air quality areas. Class I and II designations are given to areas where air is cleaner than the national ambient air quality standards. Class I areas have the most stringent regulations to protect air quality, with the lowest allowable increments of degradation. Air quality monitoring in the parks indicates that air quality is good to excellent because of the low human population, scarcity of pollutant sources, and prevailing northwesterly ocean winds. Local views are impaired primarily by fog, rain, low clouds, and ocean haze rather than pollutants. Seasonal prescribed fires on private lands and in RNSP during late summer and early fall occasionally cause short-term impairment of air quality.

Geology, Soils and Topography—The northern California coast is an active seismic area. The parks are located near the junction of three major tectonic plates. The Cascadia subduction zone lies just off the coast and is responsible for most of the large earthquakes in the area. Two important faults, the Lost Man and Grogan faults, cut through Prairie Creek Redwoods State Park. The Grogan fault also bisects the Redwood Creek basin. The South Fork Mountain fault runs through the northeast corner of RNSP in the Little Bald Hills area. The faults bring into contact distinctively different rock types that have different characteristics that affect soils and topography, which determine if and how trails can be constructed through these areas.

Bedrock in the parks is primarily of the Franciscan assemblage, a collection of sandstones, siltstones, and minor amounts of conglomerates. There are isolated exposures of chert and volcanic greenstones. Franciscan rocks are thoroughly folded, sheared, and jumbled. The other major geologic formation in the parks is a deposit of loosely consolidated sediments laid down primarily as an ancient river delta. This is known informally as the Gold Bluffs formation, and is exposed along Gold Bluffs beach and in Prairie Creek basin. Both the Franciscan and Gold Bluffs formations contain unstable rocks and soils that require careful consideration when laying out and constructing trails.

Soils in RNSP are derived primarily from the Franciscan rocks that underlie most of the parks. Other soils are derived from younger marine deposits, cobbles, sands, silts, and alluvial deposits. Some of the Franciscan soils are very unstable, and easily eroded when saturated by heavy rains. Steep terrain, rainy climate, and deep, medium-textured soils make some areas very susceptible to erosion. Landslides and ground slumping that can damage trails and roads are common occurrences in some areas of the parks.

Prairie soils often have shallow ground water in the wet season because water is perched above impermeable rock. These soils are susceptible to rutting and subsequent gully formation and erosion.

Some soils in the northern part of RNSP around Hiouchi are derived from serpentine and may be moderately to strongly alkaline. The combination of soil chemistry and poor water holding capacity produces a specialized vegetation type that supports many of the rare plants found in RNSP.

Earthquake faults, erodible soils, and heavy winter rainfall influence the topography of the parks. The terrain of the parks is generally rugged and mountainous, rising steeply from a narrow strip of coastline at sea level, to elevations over 3,000 feet in the Coast Range in inland areas of the park. Several ocean beaches have wide sandy dune areas, but the majority of coastline is bordered by steep rocky or crumbling cliffs and bluffs with a narrow strip of beach that is often awash at high tide. Major streams and ridgelines trend northwest-southeast. Stream valleys are typically steep and narrow. Numerous streams and drainages divide the parks into deep basins. There is little level ground anywhere within the parks. Level ground is often located adjacent to larger streams and rivers, on a few ocean beaches, or at the gently rounded summits of the inland mountains.

Water Resources—Surface waters of RNSP include the Pacific Ocean, the rivers and streams, and several coastal estuaries that are transitional between salt and fresh water. The most important rivers and streams are the Smith River, the Klamath River, and Redwood Creek. Mill Creek, in Del Norte Coast and Jedediah Smith state parks, and Prairie Creek, in Prairie Creek state park and the national park, are major tributaries of the Smith River and Redwood Creek, respectively. The Smith River through Jedediah Smith Redwood State Park and the Klamath River are designated as “recreational” segments of both the California and Federal Wild and Scenic River Systems.

Water Quality—Water quality in RNSP is good for beneficial uses related to visitor use of surface waters except for high turbidity in Redwood Creek during winter high flows when visitor use is low. Beneficial uses of park waters for visitors include fishing and water recreation activities such as swimming, wading and other water-contact activities. There are no major point sources of discharges of toxic pollutants into any park stream. Turbidity in Redwood Creek results from high levels of sediment from natural sources of soil erosion and from land uses such as upstream logging and associated road building.

Redwood Creek has been identified as a sediment-impaired stream by the U.S. Environmental Protection Agency (EPA) under Section 303(d)(1)(A) of the Clean Water Act, which requires that “Each State shall identify those waters within its boundaries for which the effluent limitations...are not stringent enough to implement any water quality standard applicable to such waters.” The North Coast Regional Water Quality Control Board (RWQCB) identified Redwood Creek in California’s 1996 and 1998 list submittals as water-quality limited due to clean sediment loading and designated the watershed as a high priority for TMDL development.

Floodplains and Wetlands—The Smith and Klamath Rivers and Redwood Creek have broad, well-developed floodplains. Floodplains can also be identified for Mill Creek and Prairie Creek, the largest tributaries of the Smith River within the parks and Redwood Creek, respectively. Smaller park streams generally flow in steeper channels without broad floodplains. The Smith River regularly undergoes dramatic changes in flow in a short time after heavy rains. Redwood Creek is slower to respond to rainfall but also shows dramatic changes in flow that can affect trails located close to the creek. High flows, sometimes accompanied by flooding, usually occur between November and March. Winter rains can bring high flows to all park streams, including intermittent streams that only flow after heavy rain or during wet years. Flooding near the mouths of rivers is common when high tide occurs in conjunction with high flows.

There are no year-round footbridges crossing the Smith River or Redwood Creek because substantial structures would be needed to withstand hydraulic forces generated by floods in these streams. The legislation for the national park prohibits permanent bridges across Redwood Creek. Seasonal footbridges are installed across both Redwood Creek and the Smith River after winter flows have subsided. Two seasonal footbridges across Redwood Creek provide access across the creek between the Redwood Creek Trail and the Tall Trees Grove. One footbridge is usually installed near the mouth of McArthur Creek. It marks the location upstream of which dispersed camping is permitted on gravel bars as far as the park boundary.

Wetlands are defined by a combination of water regime, soil type, and vegetation. The largest expanse of wetlands in RNSP is found at the estuaries at the mouths of the Klamath River and Redwood Creek. Streamside riparian zones are found along the major rivers and streams, and the smaller perennial tributaries of these streams such as Mill Creek and Prairie Creek. There are small wetlands near the Crescent Beach picnic area and at Lagoon Creek, Marshall Pond, and Freshwater Lagoon. Seasonal wetlands occur in low-lying or poorly drained areas throughout the parks. Seeps and springs found at higher elevations in the Bald Hills and Little Bald Hills prairies might also be classified as wetlands. Bridges and boardwalks are sometime used along trails to protect adjacent wetlands by providing a dry place for visitors to walk. Seasonally wet areas that do not receive heavy visitor use during the wet season generally do not need protective structures.

Vegetation—All major vegetation types found in RNSP can be reached by trails. Major vegetation types are old-growth coniferous forest, second-growth forest, coastal strand, coastal dunes, chaparral, a dry inland forest found in the Little Bald Hills, grasslands and prairies, and oak woodlands.

Sitka spruce dominates the forests immediately adjacent to the ocean. Inland of the spruce forest away from sea salt spray, coast redwood appears, with Douglas-fir, tan oak, hemlock, and grand fir present. With increasing elevation and increasing distance from the sea, redwood becomes less abundant and Douglas-fir, tan oak, and madrone predominate. Douglas-fir is the dominant forest species beyond 10 to 15 miles inland, except where serpentine soils give rise to a specialized dry inland forest type, the knobcone pine-Jeffrey pine forest found in the Little Bald Hills.

Some of these vegetation types, particularly second-growth forest and chaparral, have extremely dense vegetation. Some old-growth forests may have a thick understory but never as dense as the second-growth forests that were reseeded without subsequent thinning or the alder stands that grow on rehabilitated roads before other tree species recolonize the area. Planning and constructing a trail through dense vegetation requires more time than a trail through open areas such as coastal dunes or oak woodlands. Trails in dense vegetation or in areas where vegetation grows quickly, such as grasslands, require more maintenance than trails through old-growth redwood forest with a sparser understory. Keeping trails open in forests often requires maintenance following major storms that may topple trees or cause large tree limbs and branches to fall.

Invasive exotic plant species threaten native plant populations throughout the parks, but particularly in those areas where native plant communities have been disturbed for residential development or by logging and ranching. Visitors using the trails can also serve as a source of exotic plants, with seeds brought in on clothing, foot wear, gear, and with pack stock and on bicycle tires. To reduce unintentional introduction of exotic plants that might be present in livestock forage, national park regulations require that stock users bring only pelletized food or certified weed-free hay into the parks to feed their animals.

An introduced fungus (*Phytophthora lateralis*) causes Port-Orford-cedar (POC) root disease. Some Port-Orford-cedar are resistant to the disease. The Cedar Creek drainage in northern RNSP is infected, as are the main stem and South Fork of the Smith River. Some tributaries of the Smith and Mill Creek are currently uninfected. The existing Little Bald Hills trail was rerouted to avoid the infection area and further reduce the chance of spreading POC disease.

Sudden Oak Death is caused by *Phytophthora ramorum*, an introduced fungus related to the POC root disease organism. SOD is 100% fatal for tan oaks, a dominant species in some vegetation communities in the parks. SOD has not been found in RNSP to date but infection sites are known within 30-50 miles both north of the park in southern Oregon and in Humboldt County south of the park.

Both POC root disease and SOD spread to new areas by spores carried in water, mud and vehicles, people, and animals moving from infected to uninfected drainages.

Wildlife—Park trails cross all habitat types, giving visitors a chance to observe the variety of wildlife in the parks. Some wildlife species are wary of visitors and are rarely observed. Other wildlife species are more tolerant of humans and are attracted to facilities where visitors bring food and leave trash. Developed campgrounds and heavily used trailheads appear to attract more wildlife than backcountry trails.

Black bears, Roosevelt elk, black-tailed deer, a variety of birds, marine intertidal invertebrates, frogs, salamanders, and newts are commonly observed wildlife species. Over 200 species of birds are known to breed in RNSP. Both breeding and migrant birds can be seen in the variety of park habitats. Sightings of bears, mountain lions, bobcats, coyotes, and river otters are also reported regularly by visitors. Migrating gray whales are seen from coastal viewpoints and overlooks during migration seasons.

Black bears can be a problem if they become accustomed to human food sources. To prevent bears from acquiring a taste for human food, bear-proof garbage cans are provided at most trailheads. All backcountry users are required to store food properly and pack out all garbage to keep bears away from these items. Bear-proof garbage cans and food storage lockers at campgrounds also prevent jays and ravens from getting human food.

A mountain lion attack in Prairie Creek Redwoods State Park in January 2007 was the first recorded attack on a human in RNSP and the 12th ever recorded in California. All trailheads, kiosks, and visitor centers provide information on mountain lions and how to reduce the threat of attack.

Sensitive, Threatened and Endangered Species—A complete list of all threatened, endangered, proposed, candidate, rare, and sensitive plants and animals known or suspected to occur in RNSP is available in the 1999 RNSP GMP/GP FEIS/R. Species that have been listed as rare, threatened or endangered by either the state or Federal wildlife agencies are referred to as listed species.

Table 6 includes state and Federally-listed threatened, endangered, or candidate species known to occur in RNSP that might be affected by construction, maintenance, or use of trails, trailheads, or backcountry camps. There are other listed threatened or endangered species that occur in RNSP or the vicinity but these species are not likely to be affected by any of the proposals in this plan. Table 6 also lists proposed trails and backcountry camps for which construction, maintenance and use might affect a listed species.

Table 6—Threatened and Endangered Species

Species	Status/ Critical Habitat Present in RNSP	Location or Proposed Trail or Development Where Species Might Occur
Beach layia (<i>Layia carnosa</i>)	FE, SE	O, R, Freshwater Spit
Western lily (<i>Lilium occidentalis</i>)	FE	H but not known from surveys
Oregon silverspot butterfly (<i>Speyeria zerene hippolyta</i>)	FT	H but not known from surveys
Northern California steelhead trout (<i>Oncorhynchus mykiss</i>)	FT, CH	M, Q, S, T
California coastal Chinook (<i>Oncorhynchus tshawytscha</i>)	FT, CH	S, T, Redwood Creek
S. Oregon/N. California coho salmon (<i>Oncorhynchus kisutch</i>)	FT, CH, ST	A, M, S, T,
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	FT	H, O, R; not located in any surveys to date for these areas
California brown pelican (<i>Pelecanus occidentalis</i>)	FE, SE	H, O, R
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	FT, CH SE	All proposed trails except G, H, O, R, U,
Northern spotted owl (<i>Strix occidentalis caurina</i>)	FT	All proposed trails except H, O, R
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SE	All proposed trails, especially I, K
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SE	All proposed trails, especially I, J, K, R
Mardon skipper (<i>Polites mardon</i>)	FC	Little Bald Hills Trail (maintenance)
Pacific fisher (<i>Martes pennanti pacifica</i>)	FC	All proposed trails except H, O, R

T = listed as threatened under the federal Endangered Species Act of 1973, as amended or the California Endangered Species Act. The USFWS and NMFS define threatened as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

E = listed as endangered under either the Federal Endangered Species Act of 1973, as amended, or the California Endangered Species Act. The USFWS defines endangered as any species that is in danger of extinction throughout all or a significant portion of its range.

FC = Federal candidate species are those being reviewed by the USFWS and under consideration for possible federal listing as threatened or endangered and for which the USFWS has enough information to support a proposed listing.

F = Federally listed by either the USFWS (50 CFR 17.11 and 17.12) or NMFS (50 CFR Parts 222 and 227)

CH = Designated critical habitat. Critical habitat is defined as “the specific areas within the geographical areas occupied by these species ... on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection.” (16 USC §1532(5)(A))

S = State listed by the California Department of Fish and Game pursuant to Section 1904 (Native Plant Protection Act of 1977) and Section 2074.2 and 2075.5 (California Endangered Species Act of 1984) of the Fish and Game Code.

Threatened and Endangered Plants—Coastal bluffs, rock outcrops, streamside and riparian areas, wet meadows, bogs, and serpentine soils host the majority of rare plants in RNSP. Heavily forested areas contain few rare plant species.

Beach layia (*Layia carnosa*) has been found on one of the southern beaches. It is being monitored to ensure that it is not adversely affected by visitor use.

Western lily (*Lilium occidentale*) is known from a few sites near Crescent City. No lilies have been found in surveys of the Crescent Beach area of the park closest to the localities where lilies are known to occur.

The California Native Plant Society has identified several plants known or suspected to occur in RNSP as species that should be watched and protected where possible so that they do not become threatened or endangered in the future. The majority of rare plant species in RNSP occur within the serpentine-peridotite rock belt that stretches across northern Del Norte County. The serpentine soils in Jedediah Smith Redwoods State Park and the Little Bald Hills contain several endemic serpentine species. Although none of these species presently merit legal protection under either the California or federal endangered species acts, surveys for these species are conducted prior to any development or park action that might adversely affect them and any individuals encountered are protected.

Threatened and Endangered Fish—Three species of anadromous salmonids federally listed as threatened occur in rivers, creeks, and streams within the project area. There is designated critical habitat for all three species in RNSP. Coho salmon are also listed as threatened by the State of California.

California Coastal (CC) Chinook salmon (*Oncorhynchus tshawytscha*) evolutionarily significant units (ESUs) were listed as threatened by the NMFS in 1999 (USDC 1999a). The Redwood Creek watershed within RNSP falls within the CC Chinook salmon ESU.

CC Chinook typically return from the ocean to rivers, larger streams, and larger tributaries to spawn between November and early January. Winter-run CC Chinook constitute the main Chinook runs in RNSP streams. These fish begin their upstream migration around November, if access through the Redwood Creek estuary is possible, and have spawned and died by January. Adult spring-run CC Chinook have been observed in only one season since 1981, when RNSP began summer steelhead surveys, but are not typically considered to use the Redwood Creek watershed. CC Chinook

salmon spawning in the RNSP tributaries may be impeded by stream barriers, but they may be able to surmount some barriers that may impede the smaller coho salmon.

In spring, CC Chinook salmon fry migrate downstream to rear in the Redwood Creek estuary before entering the ocean in the fall. The majority of returning adults spend June, July, and August as juveniles within estuaries before completing their seaward migration. Chinook salmon usually return to freshwater after three to four years in the ocean, although two year old male spawners are commonly observed.

Juvenile CC Chinook salmon in Redwood Creek do not spend time rearing in upstream areas (Anderson and Brown 1982), but instead, utilize the Redwood Creek estuary. The Redwood Creek estuary is important as the sole rearing habitat for CC Chinook salmon in RNSP. RNSP research shows that if given the opportunity the juveniles will spend an extended period (to late summer) rearing in the estuary before entering the ocean. Prior to 1978 most young CC Chinook salmon were released from Prairie Creek Fish Hatchery in the early spring. These were fish hatched from eggs taken only four or five months earlier. Capturing sufficient numbers of Chinook to obtain their eggs was difficult because of the low numbers of returning adult fish. The low numbers of returning adult CC Chinook salmon, a species that relies totally on the estuary during its brief juvenile freshwater rearing period, are probably related in part to the summer/fall conditions in the Redwood Creek estuary. Construction of the flood control project in the estuary has resulted in degraded rearing habitat. Winter spawning/carcass counts in RNSP continue to indicate low numbers (D. Anderson pers. comm.).

Southern Oregon/Northern California Coasts (SONCC) Coho Salmon (*Oncorhynchus kisutch*) include two contiguous ESUs inhabiting coastal streams in southern Oregon and northern California coast that were designated as threatened (USDI 1997). Both the Smith River watershed in the north of RNSP and the Redwood Creek watershed in the south of RNSP fall within this ESU.

The anadromous fish populations of Redwood Creek have experienced a substantial reduction during the last 30 years, in part due to severe flood events that moved large amounts of sediment from highly eroded hill slopes to the stream channels of the Redwood Creek basin. Current fish runs are far below those that occurred 70-80 years ago. News accounts and recollections of longtime residents of the Redwood Creek watershed suggest that both the size and numbers of salmonids have declined in recent decades (Van Kirk 1994). The total population in the Redwood Creek system may still number more than 2,000 adult SONCC coho, but most occur in the Prairie Creek drainage and probably originate from the Prairie Creek Hatchery (D. Anderson field notes). With the closure of the hatchery in 1992, those numbers are probably now much lower.

After hatching, juvenile SONCC coho salmon generally spend one full year rearing in freshwater before entering the ocean. Downstream migration of SONCC coho to the ocean from upstream Redwood Creek and Smith River rearing areas occurs in early spring (March-April). Survey data from RNSP indicate that these young salmon presently move directly into the ocean, spending a minimal amount of time in the

Redwood Creek Estuary (Anderson 1995). The same is most likely true of the Smith River. Adult migration through the Redwood Creek estuary is dependent upon the mouth being open to the ocean. The Smith River usually stays open all year and so migration to the ocean is most likely direct. Whether or not the Redwood Creek mouth is open depends on a combination of wave action on the sand berm, the volume of water in the estuary, and the flow of water in the stream. Adult SONCC coho typically run upstream to spawn from late October to early March depending on access through the estuary (Anderson 1995). Recent data suggest that the peak of the spawning run begins in late November (Anderson 1998).

SONCC coho salmon distribution in the Redwood Creek basin is limited to the main stem and the larger low gradient tributaries. RNSP conducted general stream surveys of the basin in 1980 and 1981 to describe and characterize the salmonid rearing habitat and distribution of juvenile salmonids (Anderson 1988, Brown 1988). Migrational barriers were identified during these surveys. No SONCC coho were found during these early electrofishing surveys above the barriers. However, subsequent surveys in the 1990s have detected SONCC coho in streams that did not have SONCC coho in 1980-81. Whether these barriers still exist, have changed to allow fish passage, or new barriers have been created is unknown. Based on these data, NPS biologists estimate that SONCC coho occupy 26 miles of stream within the Lower Redwood Creek Basin (RNSP unpub. data).

SONCC coho salmon distribution within the Smith River basin is also limited to the main stem and larger gradient tributaries. Except for RNSP areas bordering the Smith River within RNSP, most of the coho habitat within RNSP is in the Mill Creek watershed along the main stem and west branch (RNSP unpub. data) (Voight and Waldvogel 2002). SONCC coho exist throughout all portions of these streams found within the current RNSP boundary. Life cycle timing for Smith River SONCC coho is described in Voight and Waldvogel (2002).

Specific to this proposed action area, SONCC coho are suspected to spawn at the two Mill Creek Horse Loop Trail fords. The southern ford provides relatively extensive spawning habitat in a riffle approximately 50m x 10m (164 ft x 33 ft) consisting of mixed sized substrate. Chinook salmon and steelhead trout were seen spawning throughout this riffle and at least 10 separate redds were counted in the actual ford area in 2003. The northern ford provides relatively limited spawning habitat in an approximately 5m x 5m (16.5 ft x 16.5 ft) long pool tail. Two redds of unidentified species origin (most likely Chinook based on timing and size) were seen in the actual ford area in 2003.

Northern California (NC) Steelhead Trout (*Oncorhynchus mykiss*) ESU occurs within the boundaries of RNSP within the Redwood Creek watershed.

NC steelhead are found in most small order, high gradient tributaries to Redwood Creek. They are able to leap above barriers that might impede coho salmon (D. Anderson pers. comm.). Whether logjams are barriers to movement depends upon stream dynamics such as the size of the logjam and the stream discharge as well as the timing and duration of the steelhead migration. These events change from year to year.

NC steelhead are the last of the anadromous salmonid species to return to freshwater in the annual cycle, generally between January and April. Juveniles rear in the streams for one to four years before their downstream migration to the ocean. The majority of juvenile NC steelhead in Redwood Creek spend their second year of life in the estuary and lower part of Redwood Creek (Anderson 1988). They reside in marine waters typically for two or three years prior to returning to the natal stream to spawn. Unlike other Pacific salmon, steelhead are capable of spawning more than once before they die.

The NPS began summer NC steelhead surveys in Redwood Creek in 1981 and survey data indicate a continuous decline. The highest total number of adult fish observed during summer surveys of portions of the main stem of Redwood Creek was 44 fish. No adult fish were seen in 1989. Three summer steelhead trout were found in Redwood Creek in the park during surveys conducted in the summer of 2000 and 2002, and only a single fish was seen in 2001. No other RNSP streams in the Redwood Creek basin have been surveyed for summer steelhead; these streams do not have pools large enough to support fish during the warm summer months.

Winter NC steelhead numbers are much higher. Juvenile NC steelhead are the most common and widely distributed fish in the Redwood Creek basin. During sampling efforts in the summers of 1980 and 1981, NC steelhead occurred in 57 of the 111 tributaries surveyed.

Critical Habitat for Listed Fish—Critical habitat is defined in Section 3(5)A of the Endangered Species Act as “...the specific areas within the geographical area occupied by the species... on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection”. In designating critical habitat NMFS considers habitat elements and conditions required for all life stages of the species. In addition, NMFS also focuses on the known physical and biological features (primary constituent elements) within the designated area that are essential to the conservation of the species. These essential features may include, but are not limited to, spawning sites, food resources, water quality and quantity, and riparian vegetation.

NMFS has designated critical habitat for the CC Chinook ESU to include all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River to the Russian River, California, as well as seven artificial propagation programs: the Humboldt Fish Action Council (Freshwater Creek), Yager Creek, Redwood Creek, Hollow Tree, Van Arsdale Fish Station, Mattole Salmon Group, and Mad River Hatchery fall-run Chinook hatchery programs.

In southern Oregon and northern California coasts, NMFS has designated critical habitat for the SONCC Coho ESU between Cape Blanco, Oregon and Punta Gorda, California. The critical habitat unit is all stream and estuarine reaches accessible to the species and includes water, substrate, and the adjacent riparian zone. Accessible reaches are those within the historical range of the ESU that can still be occupied by any life stage of coho.

The adjacent riparian zone is the area that provides shade, sediment transport, nutrient or chemical regulation, streambank stability, and input of large woody debris or organic matter. Habitat quality in this zone is related to the quality of riparian areas, upland areas, and inaccessible or headwater or intermittent streams that provide key habitat elements, such as large woody debris and gravel, that are crucial for coho in downstream reaches (USDC 1999b). Thus, the width of the riparian zone included as critical habitat is variable depending upon consideration of these factors. Structurally complex streams containing stones, logs, brush, and aquatic macrophytes support larger numbers of rearing coho juveniles (Scrivener and Andersen 1982) than do streams that lack these structural features.

NMFS designated critical habitat for the NC Steelhead DPS between Redwood Creek, California and Russian River, California. NC steelhead critical habitat is defined in the same manner as CC Chinook critical habitat.

Threatened and Endangered Wildlife—Marbled murrelets, northern spotted owls, brown pelicans, and western snowy plovers are federally listed threatened or endangered species known to occur in areas or habitats that would be affected by proposals for construction, maintenance, and use of trails, trailheads, and backcountry camps.

Bald eagles were removed from the federal list of threatened and endangered species in 2007 but are still being monitored as part of the delisting decision. Bald eagles continue to be listed by the State of California.

Northern spotted owls, marbled murrelets, and bald eagles are all considered by the USFWS to be sensitive to disturbance, including noise greater than background noise levels. These species are especially sensitive to noise and disturbance during nesting season when disturbance may cause adults to abandon nests altogether or to leave eggs or nestlings unprotected from predators for periods of time. Snowy plovers are susceptible to disturbance from beach use by humans during nesting season. Human use of beaches and coastal areas can interfere with pelicans attempting to rest on beaches.

Western snowy plovers (*Charadrius alexandrinus nivosus*) have not been found on any NPS lands that would be affected by any proposed trails, trailheads, or backcountry camps. The total beach habitat suitable for snowy plovers within RNSP is 1,022 acres. Historical records indicated plovers nested at Stone Lagoon and Big Lagoon beaches south of RNSP but no nesting plovers have been observed recently. No snowy plovers had been recorded within the project area since 1985 despite intensive ongoing surveys (Holm 2003). However, a pair of snowy plovers was discovered on Gold Bluffs Beach just north of Fern Canyon/Home Creek in January of 2004. An adult with two chicks was found in the same area in May 2004. Moving Highway 101 onto Freshwater Spit in 1950, vehicle use on beaches, and especially the spread of invasive alien European beach grass at Gold Bluffs Beach have probably contributed to the decline of potential nesting habitat for plovers in RNSP. The fore and back dunes of Gold Bluffs and Crescent Beaches are almost completely occupied by exotic European beach grass, which greatly reduces the potential suitability of the habitat for plovers.

Brown pelicans (*Pelecanus occidentalis*) use coastal areas for resting and foraging but do not nest in RNSP. The proposed Crescent Beach loop (H), the Redwood Creek Nature Trail (O) and the Gyon Bluff Trail (R) immediately adjacent to the coast are located in potential pelican roosting habitat. Pelicans forage in the ocean, so foraging habitat would not be affected by any proposals in this plan.

Marbled murrelets (*Brachyramphus marmoratus*) are sea birds that feed in offshore waters and nest in coastal old-growth forests along the west coast of North America. More than half of the population of marbled murrelets in California forage in the marine waters off the coast of RNSP. RNSP represents the largest block of public land with suitable and near-suitable marbled murrelet nesting habitat in California, and contains about 70% of the potentially occupied murrelet nesting habitat. Lower Redwood Creek hosts the largest numbers of murrelets in forests south of Puget Sound, Washington.

Characteristics associated with murrelet habitat are large trees with lateral branches at least four inches in diameter, which provide nesting platforms, and a mature understory that extends into the canopy of the old-growth forest, which provide protection for potential nest sites from predators. The total amount of suitable marbled murrelet habitat within RNSP (contiguous and residual old growth) is approximately 41,787 acres. The total amount of suitable habitat that would be affected by the proposed action is 14,699 acres. All suitable habitat within RNSP is assumed to be occupied unless surveys show otherwise, but the total number of murrelets, their distribution and their reproductive success within the project area are currently impossible to estimate.

Suitable murrelet nesting habitat consists of mature and old-growth forest with nesting platforms and adequate canopy cover surrounding the nest site. Forest stands containing trees greater than 32 inches in diameter at breast height (dbh) are considered potential suitable nesting habitat. Nesting habitat includes the forest stand in which nest trees are contained. Nest stands are defined as contiguous mature and old-growth forest with no separations greater than 100 meters (330 feet) wide. The nesting season for marbled murrelets in RNSP is considered to extend from March 24 to September 15.

The three state parks within the RNSP boundary contain designated critical habitat for marbled murrelets but there is no designated critical habitat in the national park. Only suitable nesting habitat is included in the definition of critical habitat; off-shore habitats are not included in the critical habitat designation. The primary constituent elements of critical habitat for murrelets are defined by the USFWS as “individual trees with potential nest platforms and forest lands of at least one half site-potential tree height regardless of contiguity within 0.8 kilometers (0.5 miles) of individual trees with potential nesting platforms and that are used or potentially used by marbled murrelets for nesting or roosting.” (USFWS 1996)

Northern spotted owls (*Strix occidentalis caurina*) are forest-dwelling birds that nest in both old-growth and second-growth forests in RNSP, and are also found in other woodlands in the parks. The total amount of suitable spotted owl habitat in RNSP that

might be affected by the proposed action is 34,859 acres. Various portions of the area that would be affected by proposed construction have been surveyed to protocol but other areas remain unsurveyed, particularly within Prairie Creek and Jedediah Smith Redwoods State Parks.

The nesting season for northern spotted owls in RNSP is considered to run between February 1 and July 31. Activity centers for northern spotted owls have been regularly surveyed to monitor nesting status. Some activity centers are known to have been occupied by barred owls. The NPS considers these areas to be unavailable to spotted owls as long as they are occupied by barred owls (Bensen 2006b).

Closed-canopied forest stands with a semi-open understory, with associated snags and large down logs, provide the primary nesting and foraging habitat for northern spotted owls. Suitable habitat contains numerous large snags, groundcover characterized by large accumulations of logs or other woody debris, and a canopy open enough to allow owls to fly within and beneath it. Second-growth forests older than forty years and forest stands as small as one acre (or less with remnant old-growth trees) are also considered suitable spotted owl habitat. The overstory should contain trees 21 inches dbh or greater and which comprise at least 40 percent of the total canopy closure.

Some park forest stands were logged using methods other than clear-cutting. In these stands, some residual old-growth trees remained scattered throughout an area after logging. In some areas, remnant stands or groups of old-growth trees remain as patches among the surrounding logged forest. Some stands logged more than 40 years ago are suitable nesting and roosting habitat for owls. If residual old-growth trees occur in the logged stands, these logged areas may also be suitable for marbled murrelet nesting.

Although both northern spotted owls and marbled murrelets are associated with old-growth forests, murrelets are entirely dependent on old-growth for nesting while owls use a wider variety of RNSP habitats for nesting, roosting, and foraging. Owls forage in a wide variety of habitats, some of which may not be suitable for nesting and roosting. Owls nest in some logged stands as described above that are not suitable murrelet nesting habitat. Murrelets forage at sea, so there is no suitable foraging habitat within park boundaries.

Bald eagles (*Haliaeetus leucocephalus*) were removed from the federal list of endangered species in 2007 but are still legally protected under other federal and state laws. Bald eagles are regularly observed in the Redwood Creek basin and at the mouth of Redwood Creek, at the mouth of the Klamath River south along the coast to Gold Bluffs Beach, at Freshwater Lagoon, and over coastal areas. Eagle roosting and nesting sites are generally large old trees in open, uneven-aged mature or old-growth forests near lakes, streams, and rivers. Areas within 0.25 mile of major creeks and rivers are considered to contain suitable nesting habitat. There are 6,704 acres of suitable bald eagle habitat in RNSP that might be affected by the proposed action.

Bald eagle breeding season extends from January 1 through August 31. Bald eagles have nested successfully in the southern part of RNSP in the past few years.

One bald eagle nest has been discovered within the project area along the existing Mill Creek Horse Loop Trail. A territory was suspected in the area in 2003 but a nest was not found until 2005. The territory fledged one eaglet each in 2003, 2005 and 2006 (Bensen 2006a). Even with the proximity of the trail, park biologists have determined, and the USFWS have concurred, that the eagle pair have become habituated and are not adversely affected by the presence of visitors on the trail as evidenced by the multiple years of successful reproduction.

The park's second eagle nest is located within 0.25 mile of the existing McArthur Creek Horse Loop trail. It is not considered to be within the area that would be affected by any of the proposals in the plan because an intervening ridge completely blocks the trail from the viewshed of the nest thereby negating potential for disturbance or effect. The nest was discovered in 1997. It produced two young in 1999, 2002 and 2003 and one in 2000, 2001, 2004 and 2005 (Bensen 2006a).

Peregrine falcons (*Falco peregrinus anatum*) were removed from the federal list of endangered species and are considered recovered from the threat of extinction but are still listed by the State of California as endangered and are fully protected in the state. Peregrines nest on steep cliffs along the coastline or on steep inaccessible rocks and cliffs inland. Both Coyote Rock and Wildcat Rock have been identified as potential nesting sites. In 2008, a suspected peregrine nest was sighted in an old growth redwood tree along Redwood Creek. Proposed alignments for the East Side Trail (M^B, M^C, M^D) near Wildcat Rock, the Lyons Ranch trail (Q1 and Q2) and the Coyote Creek bike trail (U), pass through inland foraging and potential nesting areas. The proposed Coyote Creek backcountry camp is near falcon habitat. Proposed trails along coastal bluffs pass near potential falcon cliff nesting areas, although preferred nesting sites are generally on steep cliffs not suitable for trail construction.

Mardon skippers (*Polites mardon*) are small brownish butterflies that inhabit low-growing grassland plant communities widely scattered in a few locations in the Pacific Northwest. A population of this federal candidate species discovered in the Little Bald Hills in 2004 represents the southern-most known population. Encroaching conifers in the Little Bald Hills are reducing the available habitat for the skippers.

Pacific fishers (*Martes pennanti pacifica*) are medium-sized carnivores that are a candidate species for listing under the federal Endangered Species Act. Suitable fisher habitat and suitable spotted owl habitat have been identified as the same in RNSP, so the amount of suitable fisher habitat that could be affected by the proposed action is 34,859 acres. All suitable habitat within RNSP is assumed to be occupied but the total number of fishers, their distribution and their reproductive success are currently unknown.

Cultural Resources—Cultural resources found in RNSP include archeological sites, historic structures, ethnographic resources and traditional cultural properties, and cultural

landscapes. 36 CFR 800 defines such resources as “historic properties” when they are eligible for or are listed on the NRHP. These regulations stipulate requirements for consultation with the public and local American Indians who have ancestral ties with lands currently within park boundaries. Interactions and consultations with local American Indians are included in the RNSP cultural resource program.

The lands comprising RNSP are part of the ancestral territories of the Tolowa, Yurok, and Chilula. The Chilula no longer exist as a distinct tribal group but many were incorporated into the Hoopa Valley Tribe east of the parks. Park staff work with Yurok, Hupa, and Tolowa people in matters affecting local American Indians.

Eight tribal governments serve contemporary American Indians who have traditional ties to park lands. Park staff work with the tribal governments and other local American Indians on a variety of issues affecting local Indians including management of cultural resources, access to and use of traditional lands and resources, interpretation of American Indian culture and lifeways, and employment of American Indians.

The Yurok Tribe works closely with the NPS under the provisions of a general agreement that was first signed in 1996 and has been renewed successively. The Yurok Reservation was established under the 1988 Hoopa-Yurok Settlement Act and includes 1,100 to 1,200 acres of federal lands and waters within the parks that are administered by the NPS.

The Yurok are a self-governing tribe that has assumed state historic preservation office functions for all lands within their reservation boundaries. On Yurok tribal lands, a tribal historic preservation officer (YTHPO) has been delegated the authority to serve the same functions as the state historic preservation officer (SHPO) on non-Tribal lands. The NPS would consult with the Yurok Tribe through the YTHPO on projects that would occur within the Yurok Reservation.

Consultation with the Yurok, Tolowa, and Hupa peoples is conducted on a government-to-government basis for any park project that might affect areas of concern to tribes.

Although no ethnographic resources or traditional cultural properties are currently listed on the NRHP, a number of these resources that have been documented in oral histories and in other ethnographic literature are in all likelihood eligible for listing. Local American Indians have ties to many locations throughout the parks, and numerous sacred and ceremonial sites continue to be used today. Many ethnographic sites within the parks are the locations for traditional uses, particularly the gathering of plant materials for basketmaking, medicine and ceremonies.

The archeological resources of RNSP include prehistoric and historic sites, trails, ceremonial and sacred sites, and gathering and village sites. Many of these sites have associated significance for contemporary Indians who have traditional ties to RNSP lands. About 141 archeological sites have been recorded within the national park. Three prehistoric coastal village sites near Enderts Beach and O’Men are listed on the NRHP. Most prehistoric sites are located inland and are primarily around the Redwood Creek

basin, including five sites west and thirty-four sites east of Redwood Creek. Eastern sites are primarily located along ridgetops, which served as trail routes, and on midslope benches near springs and creeks. Twenty-six sites are listed on the NRHP as components of the Bald Hills Archeological District.

Historic resources in RNSP include sites, roads, trails, buildings, structures, and cultural landscapes. Historic resources in the vicinity of proposed trails, trailheads, and backcountry camps include historic roads and trails, segments of the Old Redwood Highway, and historic sites and structures associated with ranches, mining, logging and military operations. Some historic trails and roads have been incorporated into current trails, including the Coastal Trail and the Little Bald Hills trail, which may follow a portion of the historic Kelsey Trail between Crescent City and Yreka.

Historic structures and sites presently listed or determined eligible for listing on the NRHP include the World War II Radar Station B-73, the Prairie Creek Fish Hatchery, two portions of the Old Redwood Highway, and the Lyons' Ranches Rural Historic District in the Bald Hills. The two portions of the Old Redwood Highway are located between Enderts Beach and present-day U.S. Highway 101 in Del Norte Coast Redwoods State Park and one along the Coastal Drive south of the Klamath River. The Lyons' Ranches Rural Historic District includes eight structures as well as prairies, orchards, roads, fence lines, and other features that comprise a cultural landscape.

The majority of historic sites and structures in the vicinity of proposed trails, trailheads, and backcountry have not been evaluated for eligibility for listing on the NRHP. Three historic cattle or dairy ranches along the coast that are visible from or located along the Coastal Trail within the national park consist primarily of roads, remnants of fences or corrals, scattered farm equipment, and domestic trash dumps. The remains of Murphy's Ranch, which was established along the Kelsey Trail, are located in the Little Bald Hills. A remnant of the Trinidad Trail has been found near the Tall Trees Grove in the Redwood Creek basin. This trail connected coastal supply centers with the gold mines of the interior and later served ranchers who homesteaded in the Bald Hills.

Cultural landscapes reflect human adaptation and use of natural resources expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures built. The character of a cultural landscape is defined by both physical materials such as roads, buildings, and vegetation, and by use reflecting cultural values and traditions. Initial cultural landscape inventories for RNSP were conducted in 1997 and 2000. According to these inventories, RNSP contains at least eleven cultural landscapes that are potentially eligible for listing on the NRHP. Four historic landscapes in the national park are in the vicinity of existing or proposed trails: the Lyons Ranches landscapes in the Bald Hills, the Bald Hills Archeological District, the Bald Hills Ethnographic District, and the Kelsey Trail.

Several trails and trailheads proposed in the alternatives are located in the vicinity of archeological resources, historic structures, cultural landscapes, and resources of ethnographic significance that may be impacted by proposed construction. Further

evaluation and consultation under Section 106 of the NHPA will be needed when specific trail routes and trailhead locations are identified.

Visitor Use and Experience—Visitor use is recorded at selected national park trailheads and NPS backcountry camps (Tables 2 and 3.)

Visitor experience is a term used to describe what a visitor senses physically and emotionally in a park. A visitor's expectations, impressions and memories of a park contribute to the overall park experience. How a visitor interacts with the resources, park staff, and other visitors are part of the visitor experience. Available recreational opportunities and the quality of park programs, facilities, and services round out the park experience. Visitor safety within the park is critical to an enjoyable visit. The overall measure of visitor experience is visitor satisfaction.

Uninterrupted views of rocky coastline or elk grazing in prairies, the appearance and scent of blooming azaleas, the silence in an old-growth redwood forest, the sounds of crashing surf and singing birds, and discovering an historic barn while hiking a trail are all examples of how resources contribute to a positive visitor experience.

Well-maintained trails with reasonable grades and dry smooth walking surfaces; attractive trailheads with clean restrooms; adequate parking and turning space; accurate signs and information; and backcountry camps with views and level ground for pitching tents and within reasonable hiking distance of trailheads and other camps are examples of management actions that contribute to a positive visitor experience.

Different visitors seek or appreciate different experiences. Some visitors seek a short level hiking trail while other visitors find longer, more challenging trails to be more interesting. Steepness of hiking trails is a major factor in the visitor experience. Ideally, hiking trail grades should be seven percent or less. More adventuresome visitors are willing to accept short stretches of steeper trail.

Barrier-free or accessible trails allow visitors of all physical abilities to experience the natural and cultural resources of the parks. Factors that affect accessibility of a trail include trail surface type, trail width, presence of protruding objects, tread obstacles, slope both up and across a trail, total trail length, and total elevation change.

The steepness of the terrain through most of RNSP makes it difficult to construct a long trail that meets accessibility standards for grade. Some trails already on level ground can be retrofitted with hardened surfaces to increase accessibility, as is being done in the Elk Prairie area of Prairie Creek Redwoods State Park.

Conflicts among hikers, bicyclists, and equestrians are common on multi-use trails. Conflicts can be minimized by providing adequate mileage of trails designed for different user groups or making multi-use trails wide enough to accommodate more than one user group. Multi-use trails are signed to alert trail users of the possibility of encountering different users, and to inform different user groups of trail etiquette for safe trail use by

all users. The Little Bald Hills trail is the only trail open to hikers, equestrians, and mountain bicyclists. All equestrian trails and designated mountain bike routes are also open to hikers. No serious conflicts among different user groups on RNSP trails have been reported.

Safety is critical to a positive visitor experience. Accurate directional and information signs, reasonable grades, dry level surfaces, highway crossings with adequate sight distance to allow time to cross safely, availability of potable water, and warnings about natural hazards all increase visitor safety and can be provided or controlled by management action.

Natural hazards are inherent when traveling in the backcountry. Treefall, steep slopes, creek crossings, slippery rocks, incoming ocean tides, aggressive wildlife, poisonous plants, and uneven surfaces are among potential hazards to visitors in the backcountry. Hazards can be mitigated by careful trail design and good maintenance, by providing information, or by posting warning signs.

Socioeconomic Considerations—Design, construction and maintenance of trails and associated facilities; protection and management of natural and cultural resources located along trails; interpretation of these resources; and assistance to visitors are needed to protect resources, manage the RNSP trail system, and provide a safe enjoyable experience for visitors. RNSP staff perform all these functions.

Local and regional communities in the vicinity of the parks provide visitor support and services that are not appropriate in the parks, including fuel, lodging, food, and supplies. Orick, Crescent City, Hiouchi, and Klamath are the closest communities with these services. Trinidad, Arcata, Eureka, and Brookings, Oregon provide commercial services to travelers in the region. This comprehensive trail plan seeks to connect park trails with those outside the parks, allowing community residents and visitors staying in the communities to access the parks more easily and to create a sense of connection between the parks and local communities.

Environmental Consequences

This section analyzes the effects of each alternative on park natural and cultural resources, on park visitors and their experience in the parks, on park operations and on adjacent communities. The analysis includes effects of each individual alternative and compares the effects to other alternatives, to other reasonably foreseeable future actions and proposals in the national park and RNSP as a whole, and to actions that occur outside RNSP and in the region.

The no action alternative (Alternative A) is used to compare the effects of current park actions and management direction with the proposals in the three action alternatives. There is a separate analysis for some of the specific impacts on park natural and cultural resources under the no action alternative. The impact analyses for each resource topic also include the effects of the no action alternative for comparison.

Methodology and Assumptions—Impacts on a particular resource are predicted based on impacts observed from construction, use and maintenance of similar visitor facilities in this park and other parks in similar environments and with similar types of levels of use. Impact analyses based on best professional judgment of park resource managers were derived from their analyses of effects within and outside of RNSP, including past monitoring; discussions with knowledgeable local and regional wildlife and fish biologists, botanists, foresters, fire management personnel, archeologists, and geologists; and reports and studies prepared by academic, industry, and government agency personnel.

Trail lengths are estimated from computer analyses of routes drawn on topographic maps. Volumes of soils to be excavated at stream crossings to install trail bridges are based on similar projects in the park. The area of new disturbance to soils and vegetation was calculated by multiplying the estimated length of the trail by the width of the corridor that would be affected by construction. The width of the disturbed area could vary between 4 and 10 feet. The standard finished tread for NPS hiking trails is three feet wide. The disturbed area in a trail corridor is assumed to be a minimum of four feet wide to account for construction disturbance. For trails on steeper slopes, the width of initial ground or vegetation disturbance might be as much as 10 feet if cut and fill or switchbacks are needed. A 4-foot-wide corridor results in a disturbance of 0.48 acres per mile. A 10-foot-wide corridor disturbs about 1.2 acres per mile. The existing disturbance corridor on former logging roads is assumed to be 10 feet wide. Mileages and acreages of disturbance have been rounded to the nearest 0.1.

Impact Definitions—Impact topics were selected based on scoping comments and park resources and values that would be affected by construction, use and maintenance of trails, trailheads, and backcountry camps, and other proposed actions described in the plan. Impacts are analyzed for the type of impact (beneficial or adverse), the timing and duration of impact (short-term, long-term, one-time, occasional, repeated, etc.), and the severity or intensity of impact (no effect, negligible, minor, moderate, or major). These factors are also considered in the context of the geographic location of the park and the region.

Context—The context of a park action includes consideration of the effects on resources with the project area, and on similar resources within the parks, the local area surrounding the parks, and the region.

The geographic context of an impact includes consideration of the project area, the parks as a whole, and local and regional conditions. For example, marbled murrelets occur over a larger geographic area than the park and the cumulative impact of the proposed action on marbled murrelets includes consideration of effect on these species from actions outside the project area. However, RNSP represents the largest block of public land with suitable and near-suitable marbled murrelet nesting habitat in California, and is therefore relatively more important to the long-term recovery of the species than other areas with suitable murrelet habitat.

Timing and Duration—The timing of an impact is also part of its context. For example, removing brush along a trail in October does not affect nesting birds but brushing the same trail in June would affect any birds that might be nesting in the vegetation.

The duration of an impact considers whether an effect would happen immediately, the length of time over which an impact occurs, and how long it would be noticeable. Duration is defined as short-term or long-term, although the duration of an effect is related to the resource affected. In general, long-term effects would be those that are repeated over at least several years or that would not be immediately noticeable.

Short-term effects on annual vegetation would generally be on the order of a year or less, because a year includes one complete growing season. In the context of resources such as soils or plant communities, or for long-lived plants such as redwood trees, or for geological processes such as flooding, long-term refers to effects that would occur over decades to centuries.

Type—The type of impact describes whether an action would benefit or harm a resource. A beneficial effect improves the condition of a resource, protects it from damage or loss, or favors the persistence of a resource. A harmful or adverse effect is one that worsens the condition of a resource, damages or degrades a resource, leads to the loss of the resource, alters it irretrievably in an undesirable way or changes its essential character so that the resource no longer possesses integrity or its defining characteristic. Adverse effects are unfavorable to the conservation and preservation of the resource. For cultural resources, the term “adverse” has a specific definition associated with 36 CFR 800. A separate discussion of the methodology used to assess impacts to cultural resources follows this section.

Intensity—Intensity or degree refers to how much of an effect an action has on a resource and is described as negligible, minor, moderate, or major. Major effects are considered significant. Determining intensity relies on understanding the range of natural variation of a resource. If an action has no effect on a resource, or if the effect is barely noticeable or measurable, the effect is considered negligible. Negligible effects are those that are unnoticeable, undetectable, or result in no change to a resource, or that affect so few individuals that the effect cannot be distinguished from the natural variability for a resource. Significant effects are always noticeable and result in a permanent change to a resource over a large area.

Levels of change between negligible and significant are described as minor or moderate. Minor changes to a resource are detectable but there is no long-term or permanent alteration of the resource and the changes are within the range of natural variability. Minor effects are generally noticeable but result in only a slight change to a resource or occur in a small area, and do not change its function.

Moderate effects are always noticeable, and result in some change to the resource or its function, and occur in several areas. If an action changes the resource completely or a change is irreversible, the effect is considered significant or major. Actions are more

likely to result in a gradient of change rather than a distinct level of change, so that some effects may be judged “minor to moderate” to indicate that portions of a resource in different locations might be affected slightly differently by the same action. For natural resources that are distributed discontinuously across a landscape or where individual elements of a resource are not exactly equivalent to other individuals or pieces of the same resource, a range of effects from a single action is likely.

The intensity of an impact also includes consideration of how widespread or local the area of impact would be, the amount of a resource that might be affected, or the number of times an effect would occur. If an action affects all of a resource within the park, that impact would be considered major or significant. For example, removal of vegetation to construct a single trail would have negligible effect on vegetation within the construction corridor in one area of the park. Removal of vegetation to construct all the trails, trailheads, and backcountry camps would create a greater disturbance, particularly if all the disturbance was in one vegetation type.

Intensity of effects on wildlife is determined based on the number of individuals affected in relation to the total population in the project area, the park, the region, and the range of the species. If only a few individuals of a plant or animal are affected, the impact would be considered negligible. If an action affects more than a few individuals but the effects are within the natural level of variability for a population or a resource, the effect is considered minor. If an action affects many or all individuals and causes changes to populations that are greater than the natural level of variability, the effect is considered moderate.

Methodology for Assessing Impacts to Threatened and Endangered Species—For sensitive wildlife and plants, there are two sets of definitions for intensity. One set of definitions is used in this EA based on the NEPA regulations (40 CFR 1500, *et seq.*) and the NPS guidelines for implementing NEPA. The USFWS uses a second set of definitions to accompany its determinations of effect under the Endangered Species Act of 1973, as amended. Negligible effects on listed species for the purpose of this EA are defined as those that are unnoticeable or that the USFWS has determined to have “no effect.” The USFWS has defined a “no effect” determination as the “appropriate conclusion when the action agency determines its proposed action would not affect listed species or critical habitat.” USFWS defines impacts that result in a determination of “may affect but not likely to adversely affect” as “discountable or insignificant”; these effects are defined in this EA as minor. Adverse effects occur if impacts are not discountable, insignificant or beneficial. Impacts that are determined to be adverse but can be lessened or minimized, even though incidental take may still result, are considered moderate. An effect that is determined by the USFWS to result in jeopardy to a listed species is defined as major or significant.

NMFS determinations of impacts on listed fish species, their designated critical habitat, and Essential Fish Habitat were based on the best available scientific and commercial information, current status of the listed fish, the environmental baseline for the project area, the anticipated effects of the proposed action, and the cumulative effects. The

environmental baseline for listed fish includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation for this plan. The action area for effects on listed fish from this plan includes all of RNSP including the three state parks within the national park boundary but excluding the 25,000 acres in the Mill Creek watershed added to Del Norte Coast Redwoods State Park in 2004. The action area includes 105,516 acres within the Redwood Creek watershed, including lower Redwood Creek and Prairie Creek, and part of the lower Smith River watershed.

The environmental baseline for USFWS analyses of impacts on listed terrestrial species includes analyses of the effects of past and on-going human and natural factors leading to the current status of the species, its habitat, and the ecosystem within the action area. The USFWS action area is defined as all areas to be affected directly or indirectly by the Federal action (NPS proposed action, Alternative D). For this plan, the action area includes the area defined by the NPS as including the maximum area directly or indirectly affected by existing developments, dispersed use areas, and proposed developments throughout RNSP, including the three state parks within the Redwood National Park boundary. The action area for analyses of impacts from this plan on listed terrestrial species contains approximately 35,680 acres.

Methodology for Assessing Impacts to Cultural Resources—This impact analysis methodology applies to three basic types of cultural resources—archeological sites, ethnographic resources, and cultural landscape resources (including individually significant historic structures).

Section 106 of the NHPA requires a federal agency to take into account the effects of its undertakings on historic properties including any property eligible for inclusion, or potentially eligible for inclusion, in the NRHP and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment.

The methodology for assessing impacts to cultural resources is typically based on (1) identifying areas that could be impacted from proposed actions; (2) assessing the information regarding historic properties within this area and conducting any necessary inventories and resource evaluations; (3) comparing the location of the impact area with that of “historic properties”; (4) identifying the extent and type of effects; (5) assessing those effects according to procedures established in the ACHP regulations; and (6) considering ways to avoid, reduce, or mitigate adverse effects.

Cultural resource impacts in this document are described in terminology consistent with the regulations of the Council on Environmental Quality, and in compliance with the requirements of NEPA.

The implementing regulations of Section 106 NHPA [36 CFR 800] define how the NPS will identify historic properties, conduct necessary public participation and consultations,

and assess effects. Effects on historic properties are defined under 36 CFR 800 as “no historic properties affected,” “no adverse effect,” or “adverse effect.” The SHPO advises and assists federal agencies in carrying out their section 106 responsibilities. The NPS consults with the Yurok THPO in lieu of the California SHPO on any projects that occur within the boundaries of the Yurok Reservation in accordance with 36 CFR 800.2(c)(2).

Since the precise location of trails, trailheads, and backcountry camps is not known at this time, NPS will conduct consultations under 36 CFR 800 for each selected trail, trailhead, and backcountry camp prior to construction. This will include public and tribal consultation as well as consultation with the California SHPO and/or the Yurok THPO. The ACHP would also be afforded a reasonable opportunity to comment.

Impacts to cultural resources (historic properties) could be short term, long term, or of permanent duration. Analysis of the duration of impacts is required under NEPA, but is not required and is not usually considered in assessing effects in terms of NHPA.

The intensity of impacts for cultural resources has been defined as negligible, minor, moderate, and major. Negligible impacts would be barely perceptible changes in significant characteristics of a historic property. Minor impacts would be perceptible and noticeable, but would remain localized and confined to a single element or significant characteristic of a historic property (such as a single archeological site containing low data potential within a larger archeological district or a single contributing element of a larger historic district). Moderate impacts would be sufficient to cause a noticeable but not substantial change in significant characteristics of a historic property (such as an archeological site with moderate data potential or a small group of contributing elements within a larger historic district). Major impacts would result in substantial and highly noticeable changes in significant characteristics of a historic property (such as an archeological site with high data potential or a large group of contributing elements within a larger historic district).

Impacts to cultural resources (historic properties) are considered to be either adverse or beneficial when analyzed under NEPA. However, impact type is not viewed this way when conducting analyses under Section 106 NHPA. For the purposes of assessing effects to historic properties under NHPA, effects are either adverse or not adverse. Effects under both NEPA and NHPA are considered adverse when they diminish the significant characteristics of a historic property.

Impacts can be either direct or indirect. Direct impacts result from specific actions, such as demolition of historic structures. Indirect impacts generally occur after project completion, and are a result of changes in visitor use patterns or management of resources fostered by implementation of an action.

Mitigation of Impacts—NEPA also calls for a discussion of the "appropriateness" of mitigation, and an analysis of the effectiveness of mitigation. A reduction in intensity of impact from mitigation is an estimate of the effectiveness of this mitigation under NEPA. It does not suggest that the level of effect, as defined by implementing regulations for

Section 106 NHPA, is similarly reduced. Although adverse effects under Section 106 NHPA may be mitigated, the effects remain adverse.

Presented below are the specific discussions of duration, intensity, and type of impacts to cultural resources, and a description of typical mitigation measures.

Archeological Resources—Archeological resources are typically considered eligible for inclusion in the NRHP because of the information they have or may be likely to yield. Any change in the physical attributes of an archeological site is irreparable and considered adverse and of permanent duration. Adverse impacts to archeological resources most often occur as a result of earthmoving activities within an archeological site area, soil compaction or increased erosion, unauthorized surface collection, or vandalism. Beneficial impacts to archeological resources can occur when patterns of visitor use or management action are changed in the vicinity of archeological resources such that an ongoing impact, which would otherwise continue to degrade archeological resources, is reduced or arrested. Direct impacts can occur as a result of grading, trenching, or other activities that damage the structure of an archeological site. Indirect impacts can occur as a result of increasing visitor activity or management action in the vicinity of an archeological site, leading to things such as artifact collection, accelerated soil compaction and erosion.

The intensity of impact to an archeological resource would depend upon the potential of the resource to yield important information, as well as the extent of the physical disturbance and/or degradation. For example, major earthmoving at an archeological site with low data potential might result in a minor, adverse impact. Negligible impacts would be barely perceptible and not measurable, and would usually be confined to archeological sites with low data potential. Minor impacts would be perceptible and measurable, and would remain localized and confined to archeological site(s) with low to moderate data potential. Moderate impacts would be sufficient to cause a noticeable change, and would generally involve one or more archeological sites with moderate to high data potential. Major impacts would result in substantial and highly noticeable changes, involving archeological site(s) with high data potential.

For archeological resources, mitigation may include avoidance of sites through project design, or recovery of information that makes sites eligible for inclusion in the NRHP.

Under the AHCP revised regulations of June 17, 1999 (36 CFR 800, Protection of Historic Properties; Final Rule and Notice), data recovery is considered to be an adverse effect.

Ethnographic Resources—Ethnographic resources are considered eligible for inclusion in the NRHP as traditional cultural properties when 1) they are rooted in a community's history and are important for maintaining the continuing cultural identity of the community; and 2) they meet NRHP criteria for significance and integrity.

Impacts to ethnographic resources occur as a result of changes in the physical characteristics, access to, or use of resources, such that the cultural traditions associated with those resources are changed or lost. Beneficial impacts can occur when intrusive facilities, or visitor or management activities are removed from a traditional use area; when ecological conditions are improved at a gathering area such that the traditionally used resource is enhanced; or when access for American Indian people is enhanced. Adverse impacts occur when physical changes to a traditionally used resource or its setting degrade the resource itself, or degrade access to or use of a resource.

Impacts are considered short term if they represent a temporary change in important vegetation or temporarily restrict access to an important resource, and do not disrupt the cultural traditions associated with that resource for a noticeable period of time. They are considered long term if they involve a change in an important vegetation or cultural feature, or addition of a new facility or visitor use that would change the physical character of or access to a resource for a noticeable period of time. This period of time would vary by resource type and traditional practitioners. These long-term changes would disrupt cultural tradition(s) associated with the affected resource, but the disruption would not alter traditional activities to the extent that the important cultural traditions associated with the resource are lost. Permanent impacts to ethnographic resources would involve irreversible changes in important resources such that the ongoing cultural traditions associated with those resources are lost.

The intensity of impacts to an ethnographic resource would depend on the importance of the resource to an ongoing cultural tradition, as well as the extent of physical damage or change. Negligible impacts would be barely perceptible and not measurable, and would be confined to a small area or single contributing element of a larger NRHP district. Minor impacts would be perceptible and measurable, and would remain localized and confined to a single contributing element of a larger NRHP district. Moderate impacts would be sufficient to cause a change in a significant characteristic of a NRHP district or property, and/or would generally involve a small group of contributing elements in a larger NRHP district. Major impacts would result in substantial and highly noticeable changes in significant characteristics of a NRHP district or property, and/or would involve a large group of contributing elements in a larger NRHP district and/or an individually significant property.

Cultural Landscape Resources, Including Individually Significant Historic Sites and Structures—Impacts to cultural landscape resources result from physical changes to significant characteristics of a resource or its setting. Beneficial impacts can occur as a result of restoration or rehabilitation of resources, or removal of incompatible or non-contributing facilities. Direct, adverse impacts generally occur as a result of modification of a significant characteristic of a historic structure or landscape resource; removal of a significant structure or landscape resource; or addition of new, incompatible facilities in proximity to a historic site or structure. Indirect adverse impacts may occur following project completion. These impacts are generally associated with changes in historic vegetation, or continued deterioration of historic structures. They are considered indirect impacts as they are not directly associated with project construction, but rather result

from increased visitor use or change in management of resources fostered by the completed plan.

Impacts to historic structures and cultural landscape resources are considered short term if they involve activities such as temporary removal of vegetation or other contributing resources, or road closures, where the impacts are noticeable for a period of from one to five years. Other examples of short-term impacts to historic structures include constructing scaffolding surrounding a building during rehabilitation work, or minor deterioration in historic fabric that is repairable as part of routine maintenance and upkeep. Impacts are considered long term if they involve a reversible change, lasting from five to twenty years, in a significant characteristic of a historic structure or landscape. These changes could include such actions as alteration of contributing resources or construction of an incompatible building addition or adjacent facility. Permanent impacts to a historic structure or landscape resources would include irreversible changes in significant characteristics, such as removal of contributing resources; restoration of natural systems and features; irreversible removal of historic fabric that changes the historic character of a property; or demolition of a historic structure.

Negligible impacts would be barely perceptible and not measurable, or would be confined to small areas or a single contributing element of a larger NRHP district. Minor impacts would be perceptible and measurable, or remain localized and confined to a single contributing element of a larger NRHP district. Moderate impacts would be sufficient to cause a change in a significant characteristic of an individually significant historic structure, or would generally involve a single or small group of contributing elements in a larger NRHP district. Major impacts would result from substantial and highly noticeable changes in significant characteristics of an individually significant historic structure; or would involve a large group of contributing elements in a NRHP district.

Mitigation measures for historic structures and cultural landscape resources include measures to avoid impacts, such as rehabilitation and adaptive reuse, designing new development to be compatible with surrounding historic resources, and screening new development from surrounding historic resources. In addition, the historical alteration of the human environment and reasons for that alteration would be interpreted to park visitors.

Since the precise location of trails, trailheads, and backcountry camps is not known at this time, the NPS will conduct consultations under 36 CFR 800 for each selected trail prior to implementation. This will include public and tribal consultation as well as consultation with the California SHPO and/or the Yurok THPO. The ACHP would also be afforded a reasonable opportunity to comment.

Appendix H contains a preliminary impact assessment and anticipated affects to cultural resources and historic properties including archeological sites, resources of ethnographic significance, historic structures and cultural landscapes under NHPA with

recommendations for further inventories and identification. The table provides recommendations for future planning efforts and consultation as well.

Applicable Laws, Regulations, Policies and Guidelines

Non-Impairment of Park Resources and Values—The NPS is required by law to manage park resources and values in such a way as to leave them unimpaired, unless a particular law directly and specifically provides otherwise. NPS management policies require that environmental documents disclose whether an action has the potential to impair park resources or values. Impairment is defined (Management Policies 1.4.5, NPS 2006) as an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact is less likely to constitute impairment if it is an unavoidable result, which cannot reasonably be mitigated, of an action necessary to preserve or restore the integrity of park resources and values. An impact would be more likely to constitute impairment if it affects a resource or value whose conservation is necessary to fulfill specific purposes identified in the park’s establishing legislation, or which are key to the natural or cultural integrity of the park or the opportunities to enjoy the park, or which are identified in the park’s general management plan as being of significance.

NPS Management Policies also require that NPS managers determine whether impacts that might result from an action are unacceptable. Unacceptable impacts are those that fall short of impairment but are not acceptable in a park’s particular environment (Management Policies 1.4.7.1, NPS 2006). Unacceptable impacts are those, individually or cumulatively, that would among other things

- be inconsistent with a park’s purposes or values;
- impede the attainment of a park’s desired future conditions for natural or cultural resources;
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values; or
- unreasonably interfere with park programs or activities or an appropriate use.

Analyses and findings for non-impairment of resources or values and determination of acceptable impacts for each park natural and cultural resource topic appear in the section “**Non-impairment of Park Resources**” which follows the “*Conclusions (Effects on Park Operations)*” at the end of the TBMP/EA.

Water Quality—The primary responsibility for water quality protection and enhancement in California has been delegated to the California Water Resource Control Board. In northern California, the North Coast Regional Water Quality Control Board (NCRWQCB) is responsible for adopting and implementing the Water Quality Control Plan for the North Coast Region. The BO issued by NMFS for potential effects of the

proposed action on listed fish includes BMPs, reasonable and prudent measures, and Terms and Conditions to protect listed fish; these measures would also protect water quality.

Trails that have been or would be converted from roads may contain drainage culverts. Depending the size and seasonal flow regime of the stream, some culverts may be replaced with trail bridges when the trail is repaired. If any single proposed trail bridge construction, culvert installation or maintenance project (culvert replacement) appears to have the potential to adversely affect more than 0.1 acre (4,356 square feet) of jurisdictional wetland, the NPS would contact the Corps to determine if the activity would require a permit. The NPS would obtain permits from the U.S. Army Corps of Engineers and the NCRWQCB under Section 404/401 of the Clean Water Act for culvert removals if any work involves regrading the stream channel, installation of structures below the high water mark, or placement of fill in the watercourse. None of the proposed trails are anticipated to require bridges large enough to have the potential to affect the stream channel or riparian wetlands associated with stream crossings and thus are not expected to require permits under the Clean Water Act.

Floodplains and Wetlands Executive Orders—Compliance with NPS guidelines for implementing EOs 11988 (Floodplain Management) and 11990 (Wetland Protection) is not required for implementation of the proposed action. Negligible effects to riparian wetlands would result from localized disturbance to small patches of riparian vegetation for placement of foot bridges across permanent streams. Any single stream crossing would disturb less than 200 square feet (0.005 acre) for construction of both abutments. There would be no development in floodplains because bridge footings or abutments would not be placed in any active stream channels. Therefore, compliance with the floodplain executive order is not required.

Endangered Species Act Consultations—Section 7 of the Endangered Species Act of 1973, as amended (19 U.S.C. 1536 (c)), requires that federal agencies consult with the USFWS and NMFS if agency actions have the potential to affect species listed or proposed for listing under the Endangered Species Act or designated critical habitat.

Two BAs have been prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act and submitted to the USFWS and NMFS (Bensen 2005, 2006). The BA submitted to NMFS is intended to satisfy the Essential Fish Habitat (ESH) consultation under the Magnuson-Stevens Act (16 U.S.C. 1801).

Migratory Bird Treaty Act—The Migratory Bird Treaty Act (MBTA) protects migratory birds including hawks and songbirds. Several species protected under the MBTA nest in and around the project area. Seasonal restrictions on noise and habitat disturbance to protect nesting birds would be incorporated into the project. The restrictions on removal of vegetation and seasonal restrictions on noise that apply to listed threatened or endangered species would also protect nesting migratory birds.

Cultural Resource and Tribal Consultations—The NHPA requires federal agencies to consult with the SHPO if an undertaking would have the potential to affect properties

listed or eligible for listing on the NRHP. NPS policies require consultation with affected American Indian groups. Laws and regulations applicable to protection of cultural resources have been discussed above.

Environmental Consequences Common to the Alternatives—Both general and specific impacts from proposals in this plan are analyzed. General impacts are those that can be anticipated from construction, use and maintenance of any trail, trailhead or backcountry camp. Specific impacts for proposed trails, trailheads or backcountry camps are described where such impacts can be predicted with some degree of certainty. Impacts from the no action (Alternative A) and three action alternatives B, C and D are compared under each impact topic.

Construction impacts would be limited to the smallest area possible. Trails, trailheads, and backcountry camps would be designed to minimize topographic changes, soil disturbance, and vegetation removal. Floodplains, wetlands, and known cultural resources have been avoided when choosing proposed locations for camps.

Soils and vegetation would be disturbed by grading and grubbing to construct hiking trails, trailheads and backcountry camps. Vegetation regrows within the construction corridor within one to two growing seasons. Within five years, the construction corridor has completely revegetated and the construction disturbance is not visible. The trail corridor requires regular annual maintenance to remove encroaching vegetation. The trail tread requires less maintenance to maintain a smooth surface. Trails constructed on unstable slopes with loose soils require more maintenance to remove slumps and slides.

Trails that incorporate former roads would not require new disturbance to soils or vegetation, but would require maintenance to maintain the trail surface and drainage and to keep a corridor open through vegetation. Road-to-trail conversion involves completely excavating stream crossings, restoring natural contours and landforms along road corridors by retrieving sidecast fill, uncovering buried topsoil, spreading woody debris on finished surfaces and replanting with native species (if needed). A narrow portion of the road prism (approximately five feet wide) is left upon which a trail tread is placed. The trail tread is located on the cutbench of the former road in order to create a stable tread. None of the proposed bike or horse trails would require extensive earth-moving to convert the road to a trail. The re-exposed topsoil provides a nutrient-rich base for re-establishment of native species. The woody debris scattered adjacent to the finished stream channels provides immediate surface erosion control, habitat for small terrestrial species, and additional organic matter to the soil as it decays.

Table 7 shows total acres of soil and vegetation that would be affected by construction of all trails under the various alternatives, assuming that the disturbance corridor varies between four and ten feet in width. Most vegetation removed for trail construction would be understory vegetation. Hiking trails are designed to have a 2-foot wide tread, which requires about a 4-foot wide corridor of disturbance for construction. Vegetation might be disturbed in an area as wide as ten feet on steeper slopes or for construction of horse trails.

These acres of disturbance include horse and bike routes that would be constructed on old roads assumed to be ten feet wide. Once the trail is established, vegetation would regrow onto the original road surface and the resulting trail would be maintained as a 4-foot-wide trail.

Table 7–Soil and Vegetation Disturbance

Alternative	Number of trails	Total miles of trail construction	Soils and vegetation disturbed (ac)	
			4 foot width	10 foot width
Alt A (no action)	5	24.5	11.9	28.9
Alt B	12	34.3	14.7	36.7
Alt C	19	72	35	87.2
Alt D (proposed action)	11	27.5	13.3	33.4

Table 8 shows acres of soil and vegetation including old growth that would be affected by construction of the East Side Trail under the various alternatives, assuming that the disturbance corridor varies between 4 and 10 feet in width.

Table 8–East Side Trail Alternatives

East Side Trail M	Length in miles	Miles through Old Growth forest	Previously disturbed acres	Soils & vegetation disturbed (ac)
Alt A (no action)	8.5	8.5	0	4.1-9.5
Alt B	12.9	11.3	0.8-1.9	6.3-15.6
Alt C	12.8	10.3	1.2-3.0	6.2-15.5
Alt D (proposed action)	7.1	3	2-5	3.4-8.6

Effects Specific to the No Action Alternative (Alternative A)—This section presents impacts of the no action alternative on all resources. The impacts of the no action alternative on each resource are also discussed in relation to the other alternatives in subsequent sections.

Under the no action alternative, impacts would result from construction, maintenance, and use of the East Side Trail (M^A) and other trails previously approved through Davison Ranch planning in 1996 (trails V, W, X, Y). There would be no other new construction that would affect soils and vegetation.

Construction of the Berry Glen/Lady Bird Johnson hiking trail (W) would affect between 1.8 and 4.5 acres of previously disturbed soils and vegetation along a 2.1-mile-long corridor that was logged in the early 1970s. This trail would be constructed under all alternatives.

Construction of the Skunk Cabbage bike trail (V) and the Skunk Cabbage horse trail (Y) would affect up to 4.5 and 10.1 acres, respectively, to re-open former logging roads assuming a width of 10 feet for a trail corridor. The soils and vegetation for the bike and horse trails were previously disturbed by logging and road construction.

Negligible temporary localized adverse impacts on air quality from dust from administrative vehicle use on the WSAR would continue. There would be no additional increase from dust associated with public use, and thus no additional adverse effects on air quality. Air quality is adversely affected by dust generated by vehicles only when the road surface is dry, usually between early summer and the onset of rains in the late fall. Heavy summer fog and drizzle reduces the dust temporarily but by late summer, a layer of dust usually coats vegetation along unpaved road corridors throughout the park and remains until rains wash it off.

Negligible localized adverse impacts to soils and vegetation from trail, trailhead and backcountry camp maintenance would continue within existing trail corridors and at trailheads and backcountry camps. Soils and vegetation are already disturbed at these facilities from original construction or from logging for those trails that were converted from logging roads.

There would be slight increases in turbidity in streams from runoff from bare soils when bridges or culverts are installed or replaced on existing trails. The increased turbidity is expected to be a minor, localized, temporary adverse impact on water quality and riparian areas. Increased runoff and turbidity after rains are expected until bare ground has stabilized and vegetation has re-grown on disturbed soils. Adverse effects on water quality and riparian areas from erosion and runoff would be avoided or minimized by best management practices specified in the NMFS BO. These practices include scheduling ground-disturbing activities near streams during the dry season, and by erosion-control methods such as silt-fencing to prevent runoff of bare soils into streams or scattering straw or other vegetation onto bare soils (mulching).

Construction of the East Side Trail (M^A) and the Skunk Cabbage Horse Trail (Y) under the no action alternative would affect 12 perennial and 5 intermittent streams. No other new stream crossings would be needed for construction of the Skunk Cabbage bike trail (V), the Berry Glen/LBJ Trail (W), or the Skunk Cabbage hiking trail (X).

Long-term adverse impacts on water quality and riparian areas from trail use and maintenance are avoided or minimized by constructing bridges or installing culverts to allow water to flow in the original stream channels, or by surfacing trails with crushed rock to raise the trail slightly higher than the surrounding wet areas, improve drainage, and reduce soil erosion due to wear on the trail from use.

There would be minor adverse impacts to wildlife along trail corridors from short-term noise and disturbance from trail construction and maintenance.

Under the No Action alternative (Alternative A), the East Side Trail M^A and trails V, W, X and Y would be developed. Currently, no archeological resources or historic structures are documented in the vicinity of these trails. East Side Trail M^A may pass in the vicinity of Gann's Prairie, which is likely eligible for listing on the NRHP as a Traditional Cultural Property. It is likely that this portion of trail can be designed to avoid any adverse impacts to this resource. Cultural resources inventories and NHPA Section 106 consultation would be required prior to the development or construction of any of these proposed trails. Permitted camping on the Redwood Creek gravel bars has no potential to impact cultural resources. Overall, negligible to minor adverse impacts to cultural resources from the No Action alternative would be expected.

Under the no action alternative, no trailheads or backcountry camps would be developed. The existing Lyons Ranch trailhead would not be redesigned, so that it would remain visible on the ridgetop from several locations along the Bald Hills Road. An archeological site in the vicinity of the trailhead would remain vulnerable to adverse impacts from vandalism or unintentional damage from road maintenance. Other archeological resources and historic structures in the Bald Hills Archeological District and the Lyons Ranches Historic District would be less susceptible to adverse effects from visitor use under the No Action alternative than under the action alternatives because fewer visitors would be attracted to the area without the proposed Lyons Ranch hiking trail (Q) or Coyote Creek mountain bike trail (U).

The existing RNSP trail system would allow visitors to explore most of the national park but there would be few trail connections between the national park and the state parks. There would be no new trails or designated routes linking the parks to other regional trails, unless other agencies establish links to the park boundary. The Coast-to-Crest Trail concept would remain unfulfilled. Visitors seeking a long-distance trail experience would be able to use the existing Coastal Trail segments but would not have designated pedestrian crossings of Highway 101 to connect the Coastal Trail with the inland trails. The Coastal Trail at the southern end of RNSP would not have a hiking trail connection to the Coastal Trail segment at Stone Lagoon in Humboldt Lagoons State Park; through-hikers would have to walk a short distance along Highway 101 to reach the next hiking segment. The East Side Trail would be completed as directed by the national park expansion legislation but no new trailheads would be added so that existing trailheads at Lady Bird Johnson Grove and Dolson Prairie would be more crowded as visitation and use of the East Side Trail increases. Vehicle access and circulation patterns at Mill Creek Horse Trail and Lyons Ranch trailheads would continue to be hampered by sharp turns off the main access road or lack of turning space to accommodate vehicles pulling trailers.

Cumulative Effects of Alternative A (No Action)—Cumulative effects under the no action alternative are the same as cumulative effects under any of the action alternatives. These impacts are described in subsequent sections.

Conclusions (Alternative A, No Action)—Under the no action alternative, there would be 24.5 miles of new trails in the national park, with 12.5 miles of hiking trails constructed

and 3.7 miles of bike trail and 8.3 miles of equestrian trails converted from old logging roads. There would be negligible adverse effects to air quality, floodplains, and wildlife from construction, use and maintenance from 24.5 miles of new hiking, bike, and equestrian trails under the no action alternative. Water quality and riparian wetlands would be affected by constructing new stream crossings for 12 perennial and 5 intermittent stream channels. The area of streams and riparian wetlands affected by trail construction at any single stream crossing would be very small (less than 200 square feet) and therefore, adverse effects on water quality and riparian wetlands would be temporary during construction, with negligible long-term adverse effects. Best management practices to minimize impacts include working at low flow periods and using standard erosion control techniques to prevent bare soils from eroding into active stream channels. Between 12 and 29 acres of soils and understory vegetation would be affected by construction of the new trails. Of that, between 6 and 14 acres would be in undisturbed old growth forest primarily from construction of the East Side Trail. This would be a negligible adverse effect on vegetation. Wildlife would be affected by disturbance during construction, and by use and maintenance of the trails. These effects are temporary but repeated. Based on the effects of other park trails on wildlife, the long-term adverse effects of trail construction, use and maintenance would be negligible. There would be no adverse effects on listed threatened fish because the perennial stream crossings are located high in the drainages in stream segments that are not occupied by fish. Adverse effects to fish from soil erosion during construction would be avoided by best management practices described in the BA submitted to NMFS and required under the NMFS BO. The potential for erosion near stream crossings is quickly reduced as vegetation regrows. There would be adverse effects to threatened marbled murrelets and northern spotted owls from construction of 8.5 miles of the East Side Trail (M^A) through undisturbed old growth redwood forest that does not have any current visitor facilities. The adverse effects on murrelets and owls result from an increased threat of predation from corvids attracted to the area during construction, use and maintenance of the trail. The Skunk Cabbage hiking trail (X) would also increase the risk of predation but there are existing visitor facilities in that area that already attract predators on murrelets and owls. The bike trail and horse trail would be converted from old logging roads through previously logged second growth forest and would not have any new long-term adverse effects on park resources. Therefore, the effect on park resources from construction, use and maintenance of 24.5 miles of hiking, bike, and horse trails would be adverse, generally short-term, and negligible for most resources with the exception of threatened bird species. Because of the cumulative effects on marbled murrelets and northern spotted owls from loss of habitat throughout their respective ranges and nest predation related to corvids attracted to facilities located throughout RNSP and in adjacent communities, the long-term adverse effects from construction, use and maintenance of the East Side Trail (M^A) are judged to be minor to moderate.

Effects of the Action Alternatives on Climate and Air Quality—The climate of the parks affects park operations because of safety hazards to workers and from potential indirect adverse effects to natural resources. The high winds that often accompany severe Pacific storms in coastal northwestern California knock down large branches and sometime large trees. Although snow is rare, low-elevation snowstorms can result in more fallen trees

than from windstorms. Clearing fallen debris to re-open a trail requires chain saws and other power tools to clear the trail quickly. Trails are generally closed for long periods of time following major storms if large amounts of fallen vegetation have to be removed, or if many trails must be cleared because chainsaws and other power tools are not permitted in suitable marbled murrelet and northern spotted owl nesting habitat during the noise restriction season. This season can extend from February 1 through September 15 depending on the location and the species that might be affected.

The climate of the parks affects the time available for construction of trails because of difficulty working on wet soils, the safety hazard posed by falling limbs and trees in windstorms, and because water-saturated soils or soils left bare after construction are susceptible to erosion and run-off during rainy periods. Trail construction would occur primarily in the dry season prior to onset of the rainy season to avoid or minimize soil erosion and runoff from bare soils. Several months of the dry season between May and September overlap with noise restriction period established to protect threatened bird species during their nesting seasons. Trail construction involving extensive soil excavation would be limited to areas and days in which parent soils are not saturated or susceptible to erosion and run-off.

There would be no significant long-term effects on air quality from any of the proposals in this plan. There would be minor temporary localized adverse effects on air quality from dust and emissions from motorized equipment in some construction areas. Vehicle emissions are regulated by the State of California and are assumed to be minimized by operation of licensed vehicles that meet emission standards.

The damp climate and heavy vegetation cover in RNSP keep most soils relatively moist, thus reducing the dust from soil disturbance during construction. Most trail construction is accomplished in a narrow corridor with hand tools that do not stir up as much dust as construction or watershed restoration that require heavy equipment working in a larger area.

The adverse effects on air quality from construction of trails are negligible because most of the ground disturbance would occur over 10 years in forested areas where soils are covered with a duff layer or are too moist to create dust. There would be slightly greater cumulative adverse effects on air quality under Alternative C because more trails, trailheads and backcountry camps would be constructed and maintained. The adverse effects on air quality from proposed construction under Alternative C would take place over about 10 years from disturbance on 35–87 acres throughout the national park, compared to between 11.9–28.9 acres under the no action alternative (Alternative A), 14.7–36.7 acres affected by new construction under Alternative B, and 13.3–33.4 acres affected under the proposed action (Alternative D).

Trailhead construction would occur on about 2.2 acres under Alternative B, on about 3 acres under Alternative C, and about 2 acres under Alternative D. There would be no new trailheads constructed under the no action alternative (Alternative A). Construction at the A-9 Deck and the Mill Creek Horse Trail trailheads under all action alternatives is

expected to generate more dust than other trailhead construction because these trailheads would be larger to accommodate horse trailers. Adverse effects to air quality from construction or redesign of trailheads would be temporary, localized, and negligible under the action alternatives.

Construction of backcountry camps would not require removal of all vegetation down to bare soil. The total area affected by construction of all backcountry camps would be less than 1 acre under all alternatives and require less ground disturbance than constructing trails or trailheads. Impacts to air quality from construction of backcountry camps would be negligible under all action alternatives.

Opening the WSAR to visitors under Alternatives B, C and D would increase the amount of dust stirred up by vehicles. This would be a temporary but repeated, localized adverse effect on air quality that would occur predominantly during the dry season after the road surface dries out. Although the impact is temporary during the times vehicles use the road, the impact would occur throughout the year and would be greatest during the dry season when the horse trails would receive the heaviest use. Occasional off-season rains and heavy summer fog and drizzle reduce dust and the onset of the rainy season eliminates dust from the roads. There would be greater amounts of dust generated under Alternative C because an additional 10 miles of the WSAR would be open to visitors. Impacts from dust associated with the use of the WSAR would be the same under Alternatives B and D because the road would be open only to the A-9 deck trailhead, a distance of about 5 miles from the park boundary. Impacts on air quality would occur under the no action alternative because the road would continue to be open to administrative traffic. The effect on air quality from opening the WSAR to public use would be adverse, repeated over the long-term, localized within the road corridor, negligible during damp or wet periods, and minor to moderate during the dry season.

There would be negligible short-term localized adverse effects on air quality from campfires at backcountry camps or in dispersed camping areas along the Redwood Creek gravel bars, under all alternatives. No ground fires would be permitted in the dispersed camping area on the west side of Redwood Creek (Alternative C only), and there would be no additional cumulative effect on air quality.

Cumulative Effects on Air Quality—The cumulative adverse effects on air quality under any of the alternatives would be negligible, because the primary sources of air pollution in the project area are vehicle emissions on highways and smoke from fires, and state air quality standards in the project area are rarely violated by either source. Air quality in the park and the region is generally good to excellent because of the prevailing winds from the west across the Pacific Ocean where there are no sources of air pollution and the low population compared to urban areas.

Conclusions (Air Quality)—Adverse effects on air quality would result primarily from dust generated by visitor use of the WSAR and from construction of trailheads at the Mill Creek Horse Trail, Lyons Ranch, and the A-9 deck under all action alternatives, including the proposed action. The dust generated by construction, use and maintenance of trails

and backcountry camps would be negligible under any of the alternatives. The adverse effect on air quality from dust would be a temporary, localized effect that would be minor during construction and negligible from repeated use of facilities, except for the use of the WSAR. The adverse effect of dust generated by use of the WSAR under Alternative C would be greater than under Alternatives B or D (the proposed action) because under Alternative C, an additional 10 miles of the WSAR would be open as far as the proposed trailhead at the junction of the WSAR and the Rodgers Peak Road. No significant air quality related values such as scenic vistas would be affected; the WSAR passes primarily through dense second growth forest with no long-distance views and is not considered to possess important scenic qualities. The dust generated by use of the WSAR would be a temporary condition until the onset of the rainy season. The adverse effects on air quality from dust from construction, use, and maintenance of trails, trailheads, and backcountry camps would be negligible. The adverse effects on air quality from dust from use of the WSAR would be temporary during the dry season, repeated over the long-term, and minor. Davison Road, an unpaved road that is dusty in the summer, has higher traffic volumes than are anticipated on the WSAR because Davison Road provides access to Gold Bluffs Beach and Fern Canyon, two popular park destinations. The volume of dust generated by use of the WSAR would be less than the dust from Davison Road. If the volume of dust generated by use of the WSAR is great enough to reduce visibility and create a safety hazard, the adverse effect is judged to be moderate and would be mitigated or minimized by requiring use of headlights or treating the road with a dust palliative. The long-term adverse effect on air quality and air quality related values under the proposed action (Alternative D) would be negligible.

Effects of the Action Alternatives on Geology, Topography and Soils—There would be no major changes in natural topography or landforms for construction of any trail, trailhead or backcountry camp. Trail alignments and routes would be chosen to incorporate existing topography and landforms and to be on stable soils to the greatest extent possible. These alignments minimize cut and fill, reducing impacts to soils and vegetation and increasing the stability of the trail surface. Conforming to existing topography and retaining natural drainage patterns along an alignment increases the long-term stability of a trail, which reduces maintenance and repair needed and extends the life of a trail. Trails would be constructed, maintained and repaired with hand tools instead of heavy equipment used to construct roads. Major alterations to topography that are typically seen in road construction in uneven terrain are not needed for construction of a narrow trail.

There would be no major changes in natural topography due to construction of any proposed facilities. Trails would be laid out along an elevation contour or routed to avoid extremely steep slopes to achieve a reasonable grade and to avoid future slope failure. Switchbacks would be used to make the changes in elevation for trails built in areas confined by steep drainages, unstable soils, dense second growth forest, or other features like large logs and rocks or other physical obstacles that must be avoided. Retaining walls or other soil-retaining structures would be built where a trail must traverse steep side slopes, where parent soils are unstable, where trail structures require footings and

abutments or where the trail passes under trees and the trail tread is built up to protect roots and maintain grade.

Trails that cross steep slopes might require cuts and fills and switchbacks to attain a reasonable grade, and thus may have a wider disturbance corridor and a greater amount of construction-related soil disturbance.

Newly disturbed soils are susceptible to erosion and run-off after rains until a stabilizing cover of vegetation has re-grown along trail edges or a layer of duff and litter has covered exposed soils. To reduce the potential for erosion, trails would be constructed only during the dry season when soils are not saturated. Exposed soils on the trail tread would be lightly compacted. Ferns and other native plants removed to create the trail corridor would be salvaged and replanted along trail edges to stabilize trail tread. Trails on slopes are more susceptible to erosion and run-off, and are more likely to require a temporary ground cover than trails on level ground. If it is not possible to complete trail construction adjacent to streams or on steep slopes with sufficient time for natural revegetation to occur before the onset of the rainy season, standard erosion control methods would be used such as covering exposed soils with locally obtained leaf litter and plant material grubbed out for tread construction.

There would be only minor amounts of soil disturbance associated with new mountain bike trails because proposed routes would be designated on existing roads and no new ground disturbance would be required. Soil disturbance associated with bike routes would result from repair of old roadbed and drainage ditches and replacing culverts. This would be a negligible adverse impact to previously disturbed soils.

Soil disturbance associated with construction of backcountry camps is needed only for leveling small areas to install pit toilets, picnic tables, and fire rings. The proposed backcountry camps are located on generally level ground and would not be located next to streams where fish are present. Erosion control is not expected to be needed to construct any of the camps other than locally available mulch derived from vegetation grubbed out to establish the camp.

Trailhead construction results in a larger area of bare soil in any one place than trails, which are constructed in narrow linear corridors. The largest area affected for construction of any single trailhead is about 0.25 acre. Trailheads might require more extensive erosion control than trails during and immediately after construction. Erosion control techniques such as straw bale dams, silt-fences and erosion-control matting would be employed to reduce run-off from exposed soils. Only portions of trails rather than entire length of the trail are expected to require erosion control measures in some areas where runoff might affect streams.

Trailhead construction and redesign of two existing trailheads would occur on approximately 2.2 acres under Alternative B, 3 acres under Alternative C, and 2 acres under Alternative D (the proposed action). Most areas where trailheads would be constructed have been previously disturbed by road construction, residential

development, or logging prior to park establishment. Site preparation for trailhead construction includes grubbing of vegetation and grading with heavy equipment to create level building sites.

The areas that would be disturbed for constructing trailheads are very rough estimates based on the space needed for different sizes of vehicles multiplied by a suggested vehicle capacity at each trailhead. The resulting figure was doubled to account for additional space for turning areas or pull-through spaces for large vehicles and for trailhead amenities such as vault toilets, information kiosks, and picnic tables.

The footprints of trailheads were estimated from NPS design standards that allow 200 square feet per parking space for passenger vehicles. Large vehicles such as RVs or horse trailers are allotted 400 square feet. The proposed Whiskey 40 and Coyote Creek trailheads, and the existing Lyons Ranch trailhead, are located off the Bald Hills Road. Trailers and motorhomes are not advised on the Bald Hills Road, so the size of these trailheads was calculated for 10 passenger vehicles but no RVs. Construction or redesign of these three trailheads would disturb about 0.2 acres. The trailhead proposed at the A-9 deck (all alternatives), and the existing Mill Creek Horse trailhead that would be redesigned under all alternatives were calculated for 15 RVs and 15 passenger vehicles, for a disturbance at each trailhead of about 0.8 acres. The trailheads along the WSAR (Alternative C), the Wilson Creek trailhead (all alternatives) and the Alder Camp road trailhead (Alternative C) were estimated using a capacity of 7 passenger and 3 large vehicles resulting in disturbance of 0.2 acres for each trailhead.

Total ground disturbance for construction of 4 backcountry camps under Alternative B, 5 camps under Alternative C, or 2 camps under Alternative D (the proposed action), is estimated to be less than 1 acre under each alternative. Four of the 5 sites where proposed new backcountry camps would be located are currently undisturbed. The Miller Creek site proposed under all alternatives has been disturbed by logging and associated road construction. Constructing each camp would require minor soil disturbance to create level campsites and for installing picnic tables, fire rings and pit toilets. One criterion for choosing potential backcountry camps was the availability of sufficient level ground suitable for campsites without the need to disturb large areas that would create large patches of bare soil that would become dusty or muddy.

Relocating the Fortyfour Creek equestrian camp to the G-6-1 road as proposed under all alternatives including no action would not result in any new soil disturbance because the proposed new site is previously disturbed from road construction associated with logging operations.

Cumulative Effects on Topography and Soils—Topography throughout the park and particularly in the Redwood Creek basin would remain altered by presence of logging roads and landslides on unstable soils and slopes. Soils would continue to erode in unstable areas along former logging roads. Landslides related to the presence of untreated roads would occasionally alter topography, particularly after major storms.

Around 1,400 miles of forest roads and over 5,000 miles of skid trails are estimated to have been built within the Redwood Creek basin. About 445 miles of roads and 3,000 miles of skid trails were included within the national park boundaries as of 1978. Removal of logging roads under the watershed restoration program has negligible short-term or long-term benefits to the watershed as a whole, and minor to moderate benefits to soils and topography in each restoration site over the long-term. Over the very long-term, if failing roads within the park are removed and if roads upstream and outside the park are maintained and effective erosion control implemented prior to major storms, there would be a major benefit to soils and topography in the Redwood Creek basin from preventing unnaturally high levels of erosion.

Conclusions (Topography and Soils)—Alterations to topography from all construction under any of the alternative would be negligible because sites for proposed trailheads, trails, and backcountry camps have all been chosen to reduce the amount of earthmoving needed to create level surfaces and because the maximum area of soil disturbance at any one site is less than 0.25 acre.

Proposed construction under Alternative C would result in disturbance on 35–87 acres throughout the national park, compared to between 11.9–28.9 acres under the no action alternative (Alternative A), 14.7–36.7 acres affected by new construction under Alternative B, and 13.3–33.4 acres affected under the proposed action (Alternative D).

Trailhead construction and redesign of two existing trailheads would occur on approximately 2.2 acres under Alternative B, 3 acres under Alternative C, and 2 acres under Alternative D (the proposed action).

Total ground disturbance for construction of four backcountry camps under Alternative B, 5 camps under Alternative C, or 2 camps under Alternative D (the proposed action), is estimated to be less than 1 acre under each alternative. Four of the five sites where proposed new backcountry camps would be located are currently undisturbed but soil disturbance would be minimized to avoid creating patches of bare ground that would become dusty or muddy.

Impacts to soils for construction of trails, trailheads, and backcountry camps under any of the alternatives would occur in narrow linear corridors or in areas less than 0.2 acres widely spread throughout the park. Total soil disturbance under the proposed action (Alternative D) would be less than 40 acres, with the most acreage disturbed under Alternative C (about 90 acres). Most construction would occur in soils previously disturbed by logging or road-building, although Alternatives B and C result in the most new disturbance (up to 15.6 acres for a 10-foot-wide corridor in undisturbed soils in old growth forest to construct the East Side Trail). Trails and trailheads would be designed with adequate drainage and would be maintained regularly to minimize erosion of trail surfaces. Therefore, the adverse effects on soils under any of the alternatives would be localized, long-term, and negligible, especially in comparison to the alterations to topography and damage to soil that resulted from unregulated logging and associated road construction prior to park establishment.

Effects of the Action Alternatives on Water Resources, including Water Quality, Floodplains and Wetlands—There would no effect on water quantity, including ground water supplies, from any proposal in this plan. Backcountry campers would either pack in their own water supplies or use surface water that they would treat themselves. Potable water sources would not be developed at trailheads.

Water quality, floodplains, or wetlands would not be affected by construction, use or maintenance of trailheads or backcountry camps. None of these facilities would be located near permanent surface water sources, floodplains or wetlands.

Water Quality—The proposed trails are generally located away from permanent streams or other water sources. Stream crossings are avoided if at all possible during trail layout because stream crossings require bridges that are expensive to construct and maintain. Trails that cross intermittent streams or wet areas are unusable during wet periods and require more intensive maintenance. Bridges would be constructed across perennial streams and might be constructed across some intermittent streams if the trail would be unusable or hazardous in wet periods without a bridge.

Computer analyses of the conceptual alignments of proposed trails indicate that trails proposed under Alternative A (no action) would cross 12 perennial and 5 intermittent stream channels altogether. Under Alternative B, proposed trails would cross 12 perennial and 5 intermittent streams; 31 perennial and about 16 intermittent streams under Alternative C; and 12 perennial and 14 intermittent streams under Alternative D (the proposed action).

Adverse impacts to streams or associated riparian areas from soil erosion and run-off following trail construction would be avoided or minimized by constructing trails when soils are not saturated or susceptible to erosion and run-off. If it is not possible to construct a trail or install a trail bridge with sufficient time for natural revegetation to occur before the onset of the rainy season, best management practices incorporating standard erosion control methods would be used such as scattering straw, installing silt fences or replanting with native plants. Areas adjacent to newly constructed trails where soils are disturbed are typically covered with materials found on site such as duff and leaf litter or small pieces of vegetation removed by trail construction. Trail bridges would be designed to span the stream channel completely rather than being supported by piers within the active channel. The NMFS BA describes minimization measures, and reasonable and prudent measures, and Terms and Conditions required to reduce adverse effects on water quality in streams occupied by listed fish.

Adverse effects on water quality from improper human waste disposal along trails or at backcountry camps would be avoided by providing toilet facilities that comply with all applicable state and county water quality standards and setbacks. Vault toilets would be provided at trailheads. Pit toilets at backcountry camps would be constructed in suitable soils and at least 100 feet from surface water sources. Backcountry users would be given information on minimum impact camping techniques, including techniques to avoid

introducing human waste or soap into water sources. Where toilets are not provided, regulations require backcountry users to bury human waste at least 6 inches deep in soil and at least 200 feet away from water sources, trails, and campsites. Eliminating dispersed camping along 4 miles of Redwood Creek gravel bars after 2009 under Alternative D would have minor benefits to water quality from reducing the area where improper human waste disposal might occur. Heavy winter rains and high stream flows remove any human waste improperly disposed within the creek channel or on adjacent slopes.

Floodplains and Wetlands—Computer analyses of the conceptual alignments of proposed trails indicate that trails proposed under Alternative A (no action) would cross an estimated 12 perennial and 5 intermittent stream channels altogether. Under Alternative B, proposed trails would cross 12 perennial and 5 intermittent streams; 31 perennial and about 16 intermittent streams under Alternative C; and 12 perennial and 14 intermittent streams under Alternative D (the proposed action).

Adverse effects on floodplains and wetlands would be avoided primarily by routing trails out of floodplains and away from wetlands. None of the trailheads or backcountry camps proposed under either alternative would be located in or adversely affect floodplains or wetlands.

Most trails would be constructed out of the floodplains of major rivers and creeks (Redwood Creek, Prairie Creek, Mill Creek) because trails located within floodplains can be damaged by floodwaters and might be unusable or unsafe during or after heavy rains. All culverts installed on trails would be sized for 100-year storm events. Trail bridges would be constructed across perennial streams where streambanks are too steep or the stream is too wide for safe crossing by foot or horseback. Trail bridges would be constructed to span the active stream channel at most flows, with the deck of the bridge above the high water line, and above the level of the 100-year flood. All of the perennial streams to be crossed by bridges are smaller order streams high in the drainages, usually in steep-sided narrow stream channels where bridges are high above the level of a 100-year storm event.

Bridges protect riparian zones and streams from adverse effects of trail use by giving visitors a dry level hardened surface on which to cross the stream. Bridges minimize the area of riparian zone or stream affected by the trail because visitors are confined to the bridge, and do not have to leave the trail to find a safe and suitable place to cross the stream.

Permanent trail bridges would not be constructed across Redwood Creek. This stream is too wide to construct cost-efficient permanent footbridges capable of withstanding the hydraulic forces of typical high flows. The legislation expanding the national park in 1978 prohibits any permanent bridge across Redwood Creek within park boundaries.

No bridge abutments would be placed within any active stream channels. Bridges or boardwalks (“puncheons”) would also be built across any perennially wet areas that cannot be avoided along the trail route.

Bridge sites would be chosen to avoid impacts to riparian wetlands to the greatest extent possible. If trails have to cross wetlands or streams, the trails would be constructed at right angles to the stream or wetland to minimize the footprint in the sensitive area. Stream crossings are generally placed above and outside the active stream channel and high enough above the active channel to avoid inundation at high flows, particularly for perennial streams. The perennial streams that would be crossed by proposed trails generally flow in narrow, relatively steep channels, and have a correspondingly narrow riparian area that might be classified as wetland. Therefore, only negligible adverse impacts to wetlands are anticipated for any single trail, and only minor adverse impacts to wetlands are expected for construction of all trails proposed in this plan.

Most RNSP trail bridges have 4-foot-by-6-foot finished abutments with a construction footprint of about 10 feet by 10 feet. The area of disturbance to construct an abutment is larger than the finished abutment. If each perennial stream crossing requires a bridge, and if the disturbed area for each bridge abutment measures 10 feet by 10 feet, the maximum area affected for construction of 2 bridge abutments is about 200 square feet per perennial stream crossing. If all perennial stream crossings require trail bridges with abutments, the total area throughout RNSP affected by construction of bridge abutments under Alternatives A (no action), B or D (the proposed action) is less than 0.1 acre for each alternative, and about 0.14 acre under Alternative C. Because trails are constructed with hand tools, the overall area of excavation and disturbance to emplace bridge abutments is smaller than when heavy equipment is required.

Under all alternatives including the no action alternative, dispersed camping would be allowed on the gravel bars in the Redwood Creek floodplain. Under the no action alternative and Alternatives B and C, dispersed camping would be allowed upstream of the mouth of McArthur Creek where the summer footbridge is installed for the Redwood Creek Trail crossing. About 9.25 miles of stream channel upstream of McArthur Creek has gravel bars suitable for camping. Under the proposed action (Alternative D), camping on the gravel bars would be allowed upstream of the mouth of Bond Creek. About 5.75 miles of stream channel is suitable for camping upstream from Bond Creek. Eliminating dispersed camping along 3.5 to 4 miles of stream channel between McArthur Creek and Bond Creek would have negligible effects on the Redwood Creek floodplain. Some, but not all, traces of human use such as burnt wood from campfires are removed if stream flows are high enough during the rainy season, usually between November and April. During low flow years, traces of human use would be noticeable and would persist until removed by high flows.

Riparian zones are areas next to streams where the vegetation is influenced by the stream. Riparian zones are classified as wetlands by the NPS. Some riparian zones are jurisdictional wetlands regulated by the U.S. Army Corps of Engineers. There would be very minor adverse effects on wetlands from visitors or livestock crossing riparian zones

but these impacts are anticipated to be temporary and localized in very small areas. Most hikers and equestrians prefer dry, well-drained trails to wet or muddy areas that are unpleasant or unsafe to walk or ride through. Trails would be laid out to avoid low-lying or wet areas to the greatest extent possible unless the trail is specifically intended to provide access to a wetland for interpretive purposes. Trails that are expected to receive moderate to heavy use are designed with adequate drainage or are constructed with a grade raised above low areas where puddles might form.

Map analyses indicate that approximately 1 mile of proposed trail would be within areas dominated by riparian vegetation. The Crescent Beach Loop (H) trail is proposed under all action alternatives. A portion of a trail would be constructed as a boardwalk to provide access through a coastal wetland under the proposed action (Alternative D) and Alternatives B and C. The boardwalk would be constructed to protect the wetland functions and to provide a location from which to interpret the functions and values of the wetland area. Because the purpose of the Crescent Beach Loop trail is to provide a place from which to interpret coastal wetland ecology, construction of this trail would be exempt from compliance with the NPS guidelines for wetland protection (E.O. 11990).

Cumulative Effects on Water Resources, including Water Quality, Floodplains and Wetlands—The cumulative effects on hydrology and water quality in Redwood Creek in the park relate to past logging and road building, both within what is now the national park and upstream of current park boundaries.

Damage to forest resources and fish in the Redwood Creek watershed coincided with both intensive timber harvest and a series of large storms between 1955 and 1983 that were accompanied by widespread flooding and erosion. Land use activities significantly increased erosion above naturally high levels associated with storms. The large number of improperly designed and maintained roads, landings and skid trails in the Redwood Creek watershed causes increased surface erosion and fine sediment production and delivery, and an increased potential for stream diversions, rill and gully erosion, and road related landslides with corresponding increased in sediment production and delivery into park streams. Past timber harvest in what is now the park and outside the park on unstable slopes prior to the enactment of the state Forest Practice Rules contributed to increased erosion and sediment production. These factors led to the designation of Redwood Creek as a sediment-impaired stream.

Key changes in Redwood Creek main stem channel structure over the past 40 years include increases in the volume of stored sediment; decreases in pool numbers and depth; increases in stream width and decreases in stream depth; reduced recruitment of large woody debris; deposition of high levels of fine sediments on the stream bottom; and reduced volumes of large woody debris.

Riparian wetlands in the project area, and along Redwood Creek and some of the more heavily logged tributaries, have been destroyed or degraded by the original logging and road construction, and the effects of road failures. Riparian zones were not destroyed along some streams such as the lower portion of Lost Man Creek because the watershed

was not logged, so that the riparian zone retained most original functions and values. The long-term effect on riparian wetlands in logged areas in the park relies on the effectiveness of watershed restoration at preventing future erosion that would lead to landslides that could bury riparian areas with sediment.

Road removal and landform restoration occasionally require draining of small isolated wetlands that form behind blocked culverts, filled stream channels, ditches with no outflow, and slumps in road fills. These ponds and puddles serve as breeding habitat for some amphibians, which are adversely affected by loss of this habitat. The overall effect on the forest ecosystem is negligible because the wetlands are not an original component of the ecosystem and have very limited values. The adverse effect from loss of these wetlands is negligible compared to the potential adverse effects of loss of stream functions, including riparian wetlands, in the event of road and stream crossing failures.

Conclusions (Water Resources, including Water Quality, Floodplains and Wetlands)—No floodplains would be affected by any of the proposals under any of the alternatives. There would be very localized temporary effects during construction on water quality and riparian wetlands under all the action alternatives because some of the proposed trails cross perennial streams that would require construction of foot bridges. Trails proposed under Alternative C would require a total of 31 perennial stream crossings, generally high in the drainages where these streams are narrow. The total area of riparian wetlands associated with the 31 stream crossings under Alternative C is about 0.14 acre. The total area of riparian wetlands that would be affected under each of Alternatives A (no action), B, and D (the proposed action) is estimated to be less than 0.1 acre to construct 12 crossings of perennial streams. Any construction near a perennial stream or anywhere where exposed soils could potentially erode into a stream would be implemented under the BMPs required under the NOAA BO. These BMPs are intended to protect listed fish and their habitat by protecting water quality and stream habitat. Therefore, any adverse effects on water quality, hydrology, or riparian wetlands would be negligible.

Effects of the Action Alternatives on Vegetation—Table 9 shows acres of vegetation that would be affected by construction of all trails in the national park under the various alternatives.

Table 9—Vegetation Affected by Construction

Alternative	Number of trails	Total miles	vegetation disturbed construct and maintain (ac)	
			4 foot width	10 foot width
Alt A (no action)	5	24.5	11.9	28.9
Alt B	12	34.3	14.7	36.7
Alt C	19	72	35	87.2
Alt D (proposed action)	11	27.5	13.3	33.4

Vegetation disturbance under Alternative A (no action) would affect previously logged areas for construction of the Skunk Cabbage bike trail (V) and the Skunk Cabbage horse trail (Y), which would be converted from old logging roads. Construction of Berry Glen

Trail (W) would affect between 1.8 and 4.5 acres of understory vegetation in second growth and old growth forest. Construction of the East Side Trail under Alternative A (no action) would affect between 4.1 and 9.5 acres of undisturbed understory vegetation in old growth forest.

Vegetation removal for trail construction and maintenance on 12 proposed trails would affect from 14.7 to 36.7 acres under Alternative B. There would be no new vegetation disturbance for designation of the three bike trails proposed under Alternative B, all of which would be on old roads. Construction of the East Side Trail alignment under Alternative B would affect between 5.5 and 13.7 acres of undisturbed understory vegetation in old growth forest.

The 19 trails proposed under Alternative C would disturb between 35 and 87.2 acres of vegetation for construction and maintenance. Construction of the East Side Trail alignment under Alternative C would affect between 5.0 and 12.5 acres of undisturbed understory vegetation in old growth forest. There would be no new vegetation disturbance for the horse or the three bike trails proposed under Alternative C.

Vegetation removal for trail construction and maintenance on 11 proposed trails would affect from 13.3 and 33.4 acres under Alternative D. There would be no new vegetation disturbance for upgrading old roads to create the two bike trails proposed under Alternative D, both of which would be on old roads. Construction of the East Side Trail alignment under Alternative D would affect between 3 and 7 acres of understory vegetation in or adjacent to old growth forest.

Four different alignments are proposed for the East Side Trail (trail M) under the four alternatives. The four alignments have different levels of potential disturbance and predation effects on marbled murrelets and spotted owls from construction, use, and maintenance of trails in suitable murrelet and owl habitat. Under Alternative A (no action), the trail would pass through 8.5 miles of old growth on the route between Lady Bird Johnson Grove and the Tall Trees Grove. Under Alternative B, about 11.3 miles of the total 12.9 miles of M^B would skirt the edge of old growth forest rather than create a new corridor through old growth. Under Alternative C, about 10.3 miles of the total 12.8 miles would pass through old growth. The alignment of M^A is the same as the alignment of M^C, but M^C extends beyond the Tall Trees Grove to join with the proposed Lyons Ranch Trail Loop Q1/Q2. Under Alternative D, alignment M^D passes through or adjacent to about six miles of old growth forest from the existing Emerald Ridge Trail to the intersection with the proposed Lyons Ranch Trail Q2.

The Bridge Creek hiking loop (proposed trail T, Alternative C) would require construction of 3.6 miles through old growth out of 14 miles of trail. About three of the eight miles of the Davison Ranch equestrian loop (Y) proposed under Alternative C would pass through old growth forest on abandoned logging roads, which would not require any new disturbance in old growth.

About 1.75 miles of Trail W (the Berry Glen hiking trail) passes through old growth forest, out of a total length of about two miles. This trail is proposed under all alternatives, including no action; it was originally approved in 1996 in the Davison Ranch plan.

About 5.7 miles of new trails would be constructed in Bald Hills prairie or oak woodland but less than three-quarters of a mile would be new disturbance associated with Lyons Ranch Trail Q. The remaining 5 miles of new trail in the Bald Hills would be existing road designated for mountain bike trail use as the Coyote Creek bike trail (U).

No old growth trees or trees greater than 18 inches diameter at breast height (dbh) of any species would be removed under any alternative. Trails would be designed to go around large trees, which are considered to be attractive elements that improve the visitor experience and add interest to a trail. Trail designers attempt to align trails close to large root wads and large trees, both standing and down, to showcase these resources, to improve a visitor's understanding and appreciation of redwood forest ecology, and to make a trail more attractive. The maximum size of trees typically removed for trail construction is about 12 inches dbh. Trail designers lay out a trail around trees larger than 12 inches in diameter if at all possible because it is difficult to remove and dispose of larger trees and to remove the stump to provide a level trail surface. Designers also avoid removing larger trees because large trees improve the visual quality of a trail. More small trees would be removed to construct trails in second-growth coniferous forests and alder forests that have re-grown following logging than in other vegetation types because these forests have denser stands of smaller trees that cannot be avoided.

Topsoil that is scraped off and placed on the side of a trail during construction contains a seedbank of native plants that allows natural revegetation to occur in a short time because of the moderate climate, high rainfall, and long growing season in RNSP. Some vegetation such as sword fern clumps removed from a construction corridor would be stockpiled along the side of the trail and replanted at the end of construction to improve the esthetic qualities of the trail. This minor landscaping is done primarily in forested areas where ferns and other easily transplantable vegetation is common.

Larger developments such as new trailheads in developed areas would be landscaped as the last step in construction. All landscaping would use plants native to the area obtained either by salvaging vegetation from the construction site or with plants grown from local seed sources. Only a few of the proposed trailheads would be large enough to require landscaping. Landscaping would be included in the site-specific design needed for all new trailheads.

To avoid or minimize the introduction of invasive exotic weeds and plants into the parks, equestrians and other stock users in overnight camps would be required to bring in weed-free certified feed or pelletized food for stock. Park regulations prohibit stock users from allowing their animals graze on park vegetation and require stock staying in the backcountry camps to be confined to corrals, picket lines or hitching posts provided. Backcountry regulations allow a maximum of 12 head of stock per night in the

backcountry stock camps (Elam Creek and Fortyfour Creek camps on the west side of the Redwood Creek basin, Little Bald Hills camp), so that no more than 36 stock animals would be present in all of RNSP on any given night.

Both Port-Orford-cedar root disease and Sudden Oak Death can be spread by fungal spores carried by water and humans, livestock, wildlife, and wheeled vehicles that come in contact with mud or water that might carry the spores. To contain or control the spread of these root diseases and to protect park vegetation, any trail that might have the potential to spread these root diseases would be designed to minimize the spread of the disease through alignment near ridge tops where possible, by incorporating bridges and other structures to keep hikers and equestrians out of drainages and wet areas from which the disease can spread, and by designing the trail tread so that trail users have minimal contact with wet soils.

Cumulative Effects on Vegetation—The most significant adverse impact to park vegetation resulted from logging of about 50,000 acres, primarily in the Redwood Creek basin, prior to park establishment and expansion. This impact is slowly being reduced through watershed restoration that recreates watershed conditions that more closely resemble original conditions. Proposed management of second growth forests is expected to speed the time needed to reattain conditions that more closely resemble old growth forests. This would be a long-term benefit in those areas where second growth forest management takes place.

Proposed and on-going NPS projects that affect native vegetation in the parks include watershed restoration, fire management, prairie restoration, and management of second growth forests. Watershed restoration requires removal of second growth in and immediately adjacent to old roads. The 2006-2009 watershed restoration project in Lost Man Creek will remove approximately 216 acres of vegetation on and adjacent to old logging roads and log landings. Fire management would affect about 430 acres for removal of understory vegetation and thinning of small conifers throughout the parks to reduce levels of hazardous fuels and create three fuel breaks; suppression of all wildfires; and prescribed fire in 28 units covering about 4,000 acres altogether, primarily in prairies and grasslands throughout the park. Prairie restoration involves thinning of small Douglas-fir that encroach on Bald Hills prairies in the absence of anthropogenic fire over the past 100 years. Conifer thinning projects are generally affect less than 30 acres in any one location. Restoration on about 1700 acres of second growth forests (thinning dense Douglas-fir and tan oak) in the Lost Man Creek drainage is proposed. Second growth management would not occur in streams or in buffers and would not happen in some areas where soils and vegetation would be disturbed by watershed restoration. Outside the watershed and forest restoration project areas, logged areas of the parks would continue to recover although the recovery in some dense second growth stands that were not thinned after replanting would require centuries to reattain characteristics and functions associated with old growth forest.

Outside the parks, commercial timber harvest on private lands is regulated by the California Department of Forestry and Fire Protection (CalFire) and conducted under approved timber harvest plans and other regulatory requirements.

Conclusions (Vegetation)—The total area of park vegetation that would be affected under any of the alternatives varies from between 11.9 acres for 4-foot-wide corridors along 24.5 miles (5 trails) under Alternative A (no action) to 87.2 acres for 10-foot-wide corridors along 72 miles (19 trails) under Alternative C. Under the proposed action (Alternative D), the acreage affected for construction of 28 miles of trails (11 trails) would range between 13.3 and 33.4 acres, most of which are previously disturbed by logging or ranching. No old growth trees of any species would be affected by any of the alternatives. No trees greater than 18” dbh would be removed for any proposed construction. Most trees that would be removed are 12 inches or less in diameter. The overall effects on vegetation in the park from removal of about two acres of previously disturbed vegetation for construction of trailheads and backcountry camps, up to 87 acres of understory vegetation in a linear corridor, and trees less than 12” dbh for construction of trails would be negligible.

Effects of the Action Alternatives on Wildlife—There would be no major direct adverse impacts to any wildlife species or population within RNSP under any of the alternatives, including no action and the proposed action. There would be minor temporary localized disturbance to individuals of some wildlife species during construction. Those species that are intolerant of human disturbance or are relatively sedentary and unable to move away from the disturbance would be most affected. Most individual animals would move away from the construction area but would return after the disturbance ceases. If a relatively sedentary ground-dwelling animal such as a salamander is encountered during trail construction, the animal would be moved by hand to a safe area a short distance away from the construction zone. Some small animals would be permanently displaced by construction and would not be able to find new suitable habitat. Animals that are less tolerant of disturbance might move away from an area permanently, especially if the area receives heavy visitor use. Some nesting birds might abandon an area during and after construction. However, restrictions on work seasons imposed for protection of listed threatened bird species would also protect non-listed nesting birds. No major adverse effects on park populations of nesting birds are anticipated, however, because sufficient undisturbed suitable habitat exists nearby and disturbance is confined to narrow corridors or small areas of backcountry where camps would be located. No trails, trailheads, and backcountry camps are proposed in any habitat type unique to RNSP. There are undisturbed areas in RNSP of all habitat types in which trails, trailheads, and backcountry camps are proposed. All proposed trailheads are located in previously disturbed areas and all these areas are subject to ongoing disturbance from vehicle traffic.

Backcountry camps are expected to attract wildlife if campers do not comply with park regulations to store and dispose of food and garbage properly. Backcountry campers are required to pack out all trash and dispose of it properly, and would receive this information when they obtain a permit. Patrol rangers are authorized to issue warnings or

citations to visitors who violate food storage and garbage disposal regulations, or other regulations instituted to protect resources.

To avoid habituating bears, ravens and other wildlife to human foods, all trailheads would be furnished with wildlife-resistant trash containers. Trailheads, picnic tables, and campsites would have signs informing visitors of park regulations requiring them to store and dispose of food and other scented items in such a way to avoid attracting wildlife, particularly bears. RNSP interpreters, rangers, and other staff who regularly contact visitors would emphasize the importance of keeping wildlife, particularly corvids, from becoming habituated to human food.

Allowing fires on the Redwood Creek gravel bars under all alternatives would result in consumption of driftwood and dead and down wood for campfires. Down wood in the forest and driftwood in the streams provides habitat for fish, amphibians, reptiles, and small mammals. Use of down wood for campfires is not anticipated to have major adverse effects on wildlife because dead and down wood near backcountry camps is expected to be replenished as trees and limbs fall. Firewood supplies near camps away from densely forested areas (proposed East Side Trail camps at Counts Hill under Alternative B and C, and at Coyote Creek under Alternative C) are expected to be depleted sooner than firewood around camps located closer to forests (Skunk Cabbage, Miller Creek, Copper Creek under Alternatives B and C; Skunk Cabbage and Copper Creek under the proposed action, Alternative D). After down firewood is depleted, campers might begin to break dead branches off nearby trees. Should monitoring of camps indicate that wood is being depleted faster than it is naturally replenished and that vegetation is being damaged by visitors seeking campfire wood, the NPS and CDPR would reconsider whether campfires would be allowed at some camps and take measures to reduce impacts on vegetation. Under Alternative D (the proposed action), camping on the gravel bars in the Redwood Creek channel would be permitted from Bond Creek upstream rather than from McArthur Creek upstream, eliminating camping on about four miles of stream channel. There would be a corresponding decrease in the amount of driftwood and down wood that is used for campfires in this reach of stream.

Cumulative Effects on Wildlife—The logging that occurred in the project area prior to park establishment and expansion had significant adverse effects on certain terrestrial and aquatic species of wildlife. The effects on terrestrial wildlife from clearcut logging in what is now the park were localized on individual animals but widespread throughout timber harvest areas, and were generally adverse from loss of vegetation used for shelter and food over the short-term. Small terrestrial species that are less mobile were directly affected by logging. More mobile wildlife species were indirectly affected by widespread loss of forest habitat and damage to streams. As forests regrew, some species such as deer, elk, and bear benefited from new browse. Populations of bear and elk probably increased as logged forests regrew because of the increased availability of some types of food such as cambium layers on young redwoods favored by bears and shrubs for elk browse. Overall adverse effects on populations of terrestrial wildlife were negligible to major depending on the degree of mobility of a species and whether a species favored old growth habitats or could survive in logged areas. Effects on animals

that are considered to be old growth specialists are covered under the threatened and endangered species section, because widespread loss of old growth habitat reduced populations as habitat was lost to logging and development throughout the range of temperate coniferous forests.

Adverse effects on aquatic species following logging were more substantial than on terrestrial species because of major sediment deposition into streams and widespread loss of forest cover that caused higher stream temperatures. Aquatic species were directly affected by logging and road building where stream channels were blocked with Humboldt crossings and indirectly affected by loss of shade when the forest canopy was removed and by sedimentation of streams from landslides and erosion from bare slopes. The overall initial effect on aquatic species was adverse, localized on individual animals but widespread over timber harvest areas, and moderate to major, with aquatic species populations in smaller streams subject to more damage because the entire stream was damaged. The adverse effects of sedimentation continued after forest vegetation regrew.

Several species that suffered major population declines from loss of forest habitat due to logging throughout their range were listed as threatened under the federal or California endangered species acts.

Conclusions (Wildlife)—The effects on wildlife under any of the alternatives would be negligible to minor, depending on the size and degree of mobility of a species and its tolerance of human presence and noise disturbance. Impacts from trail construction would occur in narrow linear corridors during daylight hours and would be short-term, usually within one season. Vegetation would grow back within 1 to 2 growing seasons. The acreage of vegetation disturbed for trail construction for all of the alternatives ranges from 12 to 87 acres along linear corridors in a variety of vegetation types throughout the park. The loss of this area of vegetation spread throughout the park would have a negligible long-term adverse effect on wildlife populations. The proposed action (Alternative D) would affect up to 9 acres of understory vegetation in old growth forest but no old-growth dependent wildlife species would be affected by loss of understory vegetation along a 4- to 10-foot-wide trail corridor. Non-discretionary terms and conditions from the USFWS and NMFS BOs to implement reasonable and prudent measures to avoid and minimize adverse effects on listed wildlife species and to reduce and monitor injury and mortality to listed threatened fish would protect other wildlife and aquatic species as well. Measures to reduce noise disturbance during nesting seasons include restrictions on the seasons and time of day that work is allowed and noise buffer distances; and limitations on the size of trees that can be removed to avoid or minimize adverse effects on habitat.

Effects of the Action Alternatives on Sensitive, Threatened and Endangered Species—The proposed action (Alternative D) and the other alternatives, including no action, have the potential to adversely affect listed threatened or endangered species. The proposed action has been developed in consultation with the USFWS and NMFS to avoid or minimize impacts to listed species to the greatest extent practicable.

A complete list of all measures to avoid or minimize impacts on listed species are found in the BAs and/or associated BOs that have been issued by the USFWS (file number 8-14-2003-1517, dated January 31, 2007) or NMFS (ARN 252422SWR2003AR8825 dated September 17, 2007) as a result of consultations under Section 7 of the Endangered Species Act on 1973, as amended. These measures have been agreed upon following formal consultation on the proposed action with USFWS and NMFS under Section 7 of the Endangered Species Act of 1973, as amended. In addition to measures developed by the NPS and described in the BAs, the resulting BOs contain non-discretionary Terms and Conditions for implementing reasonable and prudent measures to minimize incidental take of listed species.

Measures to protect bald eagles, spotted owls, and marbled murrelets include restrictions on level of noise allowed, seasons, and time of day that work may be done. Measures to protect coho and Chinook salmon and steelhead trout include actions to protect water quality and aquatic habitat from erosion and sedimentation, and actions to protect fish during instream work.

In addition, the RNSP Conservation Strategy (NPS 2003) describes the overall strategy for managing the parks in such a manner as to conserve listed species, and to avoid or reduce impacts on listed species from all park management actions.

Plants—No sensitive or rare plants, including beach layia, western lilies or other plants listed federally or by the state as threatened or endangered, would be adversely affected by any proposed construction. Proposed trailhead locations are in previously disturbed areas that are unlikely to support rare plants. No sensitive plants are known from any of the locations proposed for backcountry camps. All construction areas would be surveyed by RNSP botanists prior to ground disturbance. If any rare plants are encountered on a proposed trail alignment, the plants would be marked so that individual plants can be avoided by routing the trail away from the plants.

Marine Species—There would be no effects on listed marine species from any of the proposals in this plan or from any backcountry use.

Invertebrates—Small portions of the Crescent Beach Loop trail (trail H) (alternatives B, C and D, the proposed action) route pass through potential suitable Oregon silverspot butterfly habitat. The entire length of the Crescent Beach Loop trail (H) would be a wheelchair-accessible boardwalk approximately 5 feet wide. It is expected that the total amount of suitable habitat affected by the proposed trail H construction is less than 0.5 acre.

No silverspots were detected in this area during repeated surveys for the species in the early to mid 1990s and in 2004 nor have silverspots been reported anywhere within RNSP. It is suspected that the microclimate of this area may be too cool for silverspots (S. Matoon pers. comm.).

Therefore, the potential for individual butterflies to colonize the area or to be disturbed by construction or future use of the proposed trail H is extremely low. NPS biologists would conduct surveys for the species along the trail route prior to construction. If the species is found in the construction area, the NPS would take actions to protect individuals (i.e. cease construction) and enter into consultation with USFWS.

The mardon skipper may be negatively affected by construction of the Crescent Beach Trail (H) under the proposed action (Alternative D), and under Alternatives B and C, but the negative effects should not measurably impact the local population. The effects are due to a small amount of disturbance from visitor and staff use of existing trails as well as a low possibility of some individuals being trampled by visitor and staff use of existing trails.

Fish—Actions proposed under this plan that have the potential to affect one or more of the federally listed fish species either directly or indirectly include camping on the gravel bars in Redwood Creek and backcountry camps in the Redwood Creek corridor, stock use near streams occupied by listed fish, construction of trails near streams occupied by listed species, replacement or installation of culverts or trail bridges on occupied streams, and construction of trails within the riparian zone of streams occupied by listed fish.

Visitors who camp on Redwood Creek gravel bars would potentially affect listed fish species (primarily summer NC steelhead) by harassing fish either accidentally, incidental to other activities or on purpose, and by recreational fishing. Redwood Creek is open only to catch-and-release fishing downstream from the mouth of Bond Creek. Anglers might incidentally catch summer steelhead while fishing for other species. Fish that have been released after being caught on barbless hooks experience varying degrees of stress, which reduces long-term survival of individual fish. High summer water temperatures also cause stress on fish. Water temperatures in Redwood Creek exceeded 60°F (16°C.) about seventy to ninety percent of the time during the summer of 2000. A California Department of Fish and Game study of summer steelhead mortality due to catch-and-release fishing found that mortality increased with increasing water temperature (Taylor and Barnhart 1997). Released fish suffered ten percent mortality at 70°F (21° C) and 35 percent at 75°F (24°C).

Potential increased visitor use resulting from improved trail linkages and increased access to new and existing areas of RNSP resulting from the activities described in the proposed action may cause some indirect effects to listed salmonids.

The proposed East Side Trail segments (M, Q) would increase visitor access to Redwood Creek pools near the proposed Copper Creek back country camp. The potential for disturbance would most likely be relatively low because of the remote location of the camp, expected low visitation to the new camp and the proposed visitor education program described in the proposed action. No other pools along Redwood Creek should experience increased swimming by visitors because none of the other sections of the East Side Trail (M, Q) are within easy access of Redwood Creek (i.e. the proposed trail is at

least 0.25 to 0.5 miles from the creek with dense old growth forest and steep slopes in between).

Existing trails and dispersed camping opportunities do provide visitors access to pools along Redwood Creek from an area approximately 1 mile upstream of Bridge Creek all the way downstream to the RNSP boundary. An unknown number of visitors do swim in Redwood Creek in the summer. Anecdotal observations indicate that most visitors swim in areas upstream from Bond Creek, particularly around the Tall Trees Grove. This is probably due to the persistent fog and lower air temperatures on the lowest stretches of Redwood Creek and ease of access to the creek via the Tall Trees Trail. Some summer steelhead along these stream reaches are presumably being disturbed by swimmers. Again, it is unknown if this disturbance constitutes a severe enough effect to decrease survivorship or reproduction in adult summer NC steelhead.

The proposed actions are not expected to increase catch and release fishing caused disturbance beyond current levels because no new trails would access fishing areas not already accessible by existing trails. The California Department of Fish and Game currently allows recreational fishing along Redwood Creek downstream of Bond Creek. RNSP is currently addressing the issue of recreational fishing effects to summer steelhead through comments to the California Department of Fish and Game Commission.

Backcountry campers at proposed camps at Miller Creek and Counts Hill (Alternatives B and C) and Copper Creek (Alternatives B, C, and D) are likely to seek cooler areas along Redwood Creek for swimming on hot days, even in the absence of established trails from the camps to the creek. Human use of this part of Redwood Creek is likely to increase if access to this area is improved. Most of the deep pools in Redwood Creek that are the prime summer habitat for summer steelhead are upstream of the Tall Trees Grove. Fish prefer the deep pools, which are cooler than the main channel and shallower pools. Increasing human access to Redwood Creek through construction of additional trails upstream of the Tall Trees Grove would increase the potential for adverse effects on summer steelhead using the deep cold pools. Under Alternative D (the proposed action), a camp in the Redwood Creek basin is proposed at Copper Creek, but not at Miller Creek or Counts Hill Prairie. This would decrease the number of people who might hike to the creek from a camp, which would increase the level of protection to summer steelhead in the deep pools during the hot summer months.

NC steelhead juveniles, adult “summer” NC steelhead and juvenile SONCC coho salmon could potentially be temporarily disturbed by visitors swimming in deeper pools that provide cool water and anti-predator refugia for these species. Salmonids forced out of these deeper pools and into warmer, shallow water could subsequently suffer from increased thermal stress and predation if there were no easily accessible cool water pools or cover nearby. It is unknown if being flushed from cool water pools would affect salmonid survivorship or reproduction. Juvenile CC Chinook salmon migrate downstream to estuaries by summer and so are not present in the upper reaches of streams when visitors would be swimming in pools (Anderson pers. comm).

Under all alternatives including the no action alternative, dispersed camping would be allowed on the gravel bars in the Redwood Creek floodplain. The NPS proposes to eliminate dispersed camping from about four miles of the stream under Alternative D (the proposed action). Under the no action alternative and Alternatives B and C, dispersed camping would be allowed upstream of the mouth of McArthur Creek where the summer footbridge is installed for the Redwood Creek Trail crossing. About 9¼ miles of stream channel upstream of McArthur Creek has gravel bars suitable for camping. Under the proposed action (Alternative D), camping on the gravel bars would be allowed upstream of the mouth of Bond Creek. About 5¾ miles of stream channel is suitable for camping upstream from Bond Creek. Eliminating dispersed camping along four miles of stream channel between McArthur Creek and Bond Creek would have negligible to minor effects on the fish populations in Redwood Creek because the level of human use on the gravel bars is low and this section does not have the deep cold pools important to fish during the hot summer months.

NMFS has recommended that the NPS monitor anglers and campers to determine if adverse impacts are occurring from recreational fishing, and whether increased patrol, public education, or additional angling restrictions are warranted. RNSP biologists would continue to monitor fish presence and visitor use of pools during annual summer steelhead surveys along Redwood Creek. The NPS would enhance its program for public education about and awareness of the presence of listed fish species and the potential effects of human use on these species through posting information about these fish on trailhead kiosks, through occasional ranger patrols and visitor contacts along the creeks, through contacts with visitors in visitor centers, and when issuing backcountry permits.

A new RNSP interpretive program concentrating on the potential negative effects of human swimmers disturbing salmonids holding in cold pools during the summer would be initiated. Programs would primarily target areas along Redwood Creek and backcountry permit users. The objective of the program is to reduce the number of visitors swimming in the deeper pools of Redwood Creek in summer when salmonids are stressed by elevated stream temperatures. Interpretive and law enforcement staff would receive extra resource training and would make the issue a central interpretive theme for the park. All future RNSP visitor orientation publications would include a message concerning this issue. Interpretive staff at each of the park's visitor centers would also discuss the issue in interpretive programs as well as during casual visitor contacts. Backcountry roaming interpretive staff and patrolling law enforcement staff would also discuss the issue during casual visitor contacts, particularly near the proposed Copper Creek backcountry camp. Other media including signs, videos and permanent displays would be utilized as funding becomes available.

Stock use near streams is very low. Equestrian trails have been specifically routed to avoid streams to the greatest extent practicable and to minimize the time stock spend in the vicinity of streams. Stock use near streams is essentially limited to stock drinking from the streams while crossing them. The existing Little Bald Hills equestrian camp is far enough from streams occupied by listed fish (Mill Creek, Smith River) that no impacts to fish are anticipated from stock use of this camp. Backcountry horse camps on

the Orick Horse Trails are located far enough from tributary streams that stock trespass is not likely unless equestrians ignore park regulations requiring stock to remain on marked stock trails or confined at designated camps. The only stream channels in which stock are permitted are the streambed of Redwood Creek up to the first footbridge/trail crossing, and the two fords along the existing Mill Creek Horse Loop Trail.

The existing Mill Creek Horse Trail has two fords that cross Mill Creek. Both fords are spawning areas used by anadromous salmonids. A seasonal closure has been placed on the southern ford from 15 October to 31 May and from 15 October until 31 March on the northern ford. The seasonal closures are meant to protect spawning SONCC coho and other anadromous salmonids and their redds from disturbance and trampling caused by hikers and horses crossing the fords. No park staff or visitors are allowed to cross the fords during the seasonal closure period. The seasonal closures have been incorporated into the NPS Superintendent's compendium and are an enforceable parks rule subject to penalty for violation. Seasonal closure signs have been placed at the Mill Creek Horse Trail trailheads and at the turn offs to the fords themselves. A visitor education program has been initiated to inform the public of the seasonal closure and the reasons for the closure.

Emergent fry and juvenile stream rearing coho would not be affected by visitors crossing the fords on the Mill Creek Loop Trail because both fords are located on relatively fast flowing pool tail or riffles. Juvenile coho salmon in the Smith River system spend the vast majority of their time foraging and seeking cover in pools containing sufficient complex structure, such as that provided by large woody debris, cut banks and overhanging vegetation (Voight and Waldvogel 2002). They also may feed opportunistically on concentrated prey found at the head of pools just below riffles and pool tails. Juvenile coho only use pool tails and riffles while transiting from pool to pool and thus are in any one location in a pool or riffle for a few seconds (pers. obs., Voight and Waldvogel 2002). The chance of a fish being crushed by a passing hiker or horse is therefore negligible. After one year, coho salmon migrate straight out to sea (Anderson 1995) and thus are out of the area of effect. Adult coho return to spawn when sufficient water volume exists in Mill Creek to allow migration upstream, generally in late November (Voight and Waldvogel 2002). Both fords are closed (15 October to 31 May on the south ford and 15 October to 31 March on the north ford) to visitor crossing on foot or by horseback during the time that adults are present in Mill Creek from November through early February (Voight and Waldvogel 2002), and thus there is no potential for harm to adult coho from trail use.

All proposed construction sites near streams that contain designated critical habitat for listed fish would be inspected by RNSP fisheries biologists to determine if construction would adversely affect critical habitat and if so, what measures would be necessary to avoid or minimize adverse effects. Trail construction is expected to have only minor temporary adverse effects on riparian areas from vegetation removal and soil erosion in small areas next to streams. Only small amounts of overstory vegetation and a small number, if any, of trees that provide shade for the creek would be removed for trail construction. Soil erosion would be minimized by conducting ground disturbance when

soils are not saturated and implementing effective erosion control measures and best management practices. No large woody debris would be removed from the stream channel or banks for bridge construction. Large woody debris that might be present in streams near trail corridors is considered to be an attractive feature and is left in place to add interest to a trail.

To avoid impacts to listed fish species from soil erosion and subsequent run-off into fish-bearing streams, construction and annual maintenance of trails near streams would be scheduled when soils are not saturated or susceptible to erosion. Therefore, only negligible or minor temporary adverse effects on listed fish species (other than summer steelhead trout and critical habitat) are anticipated from trail construction proposals in this plan.

Three proposed trails (G, H, R) are located entirely outside of anadromous watersheds and thus their construction has no potential to affect anadromous fish or their habitat.

Several trails or alignments (A, M, P, Q, W, X, Z) proposed under various alternatives are located either partially or wholly within anadromous watersheds and would require some ground disturbance during construction. Construction of trails away from streams would not cause any increase in sedimentation. Trail treads (as opposed to the trail corridor through vegetation) would be at most three feet wide for foot trails and four feet wide for horse trails. Any excavated fill would be placed within a narrow corridor and would be either be planted with vegetation removed from the trail route or would rapidly revegetate after construction. All excavated material within inner gorges of streams would be moved out of the inner gorge to more stable locations. Only small trees directly along the tread route would be removed, and thus, no new trail would be directly exposed to rainfall because either the entire or a significant portion of the forest canopy would be retained. In second growth areas, where the most exposure to rainfall would be expected because a higher proportion of small trees would be removed, rapid canopy growth would completely cover the trail tread within a few years. In addition, any negligible amount of sediment produced would be captured by surrounding vegetation and downed woody debris naturally occurring on the forest floor. Drainage structures such as outsloped treads and waterbars; slope stabilizing features such as retaining walls; and regular maintenance would ensure that newly constructed trails would not fail and cause sediment to enter a stream. Replacement of abutments on bridges in reaches occupied by anadromous fish would occur during periods of low stream flow but prior to upstream migration of adult anadromous salmonids.

As many as 31 perennial stream crossings could require for constructing all proposed trails under Alternative C, 12 under Alternative B, and 12 under Alternative D. Bridges or culverts needed for these crossings would be designed to retain the natural flow and drainage patterns and allow fish passage. Park geologists and fisheries biologists would inspect all bridge and culvert locations as part of the trail design process to ensure that stream crossing structures do not impede fish passage and do not adversely affect fish habitat. Park geologists would determine the size of culverts needed to carry a 100-year storm flow for all new construction and replacement culverts.

The East Side Trail M (proposed under all alternatives) would require footbridges across as many as 10 perennial streams that could potentially contain NC steelhead. Work may occur during the spawning season. The East Side Trail alignment under the proposed action (Alternative D) would require bridges across two small high gradient tributary streams. Most of the streams would be crossed well upslope of their junctions with Redwood Creek where presence/absence surveys were conducted (D. Anderson, pers. comm.). Accessible spawning reaches on these streams are most likely highly variable from year to year due to fluctuating flow levels and most likely steelhead do not reach the proposed stream crossing locations. The chances of an individual fish being present at a bridge site during construction activities is low. On-site construction project personnel and NPS fish biologists would regularly monitor downstream sections of the creek for any “pooled” fish that appear to be inhibited by bridge construction activities. If fish appear to be disturbed (e.g. fish swimming back and forth rapidly or repeatedly seek cover) then activities would cease until fish have moved out of the work area.

The Coyote Creek Bike Loop (U), proposed under Alternatives B, C, and D (the proposed action) would require two crossings of intermittent reaches of streams occupied by SONCC coho salmon and NC steelhead. The proposed Coyote Creek Bike Loop would be established on an existing road with the stream crossings already in place as culverts beneath the existing road. The proposed trail would cross only intermittent reaches of Coyote Creek and there is no possibility for anadromous salmonids to exist at any of the crossings.

The Mill Creek Horse trailhead off Bertsch Avenue is not within an anadromous watershed and has no potential to affect habitat. The Lyons Ranch trailhead is located in flat, ridge top area that is at least 0.5 mile from the nearest perennial stream. Any ground disturbance and subsequent potential sediment generation associated with the construction or expansion of this site would be buffered by the large areas of intervening vegetation. The A-9 Deck trailhead would be placed on an existing flat, ridge top cleared area, which used to be a large log deck. No new ground disturbance would be necessary to build this trailhead. The Wilson Creek trailhead is located within a few hundred yards of the mouth of Wilson Creek. The area is already heavily disturbed due to nearby Highway 101 and Wilson Creek Road. Any negligible amount of sediment which is not buffered by soil erosion control measures including use of silt screens, construction occurring only when soils are not saturated, depositing fill excavated near streams away from streams, and use of weed free straw, would enter the creek within the final few hundred yards of the stream where little to no suitable spawning or rearing habitat exists before the stream enters the Pacific Ocean. Once completed, this trailhead would not pose any sedimentation threats because it is located at least 300 feet from the creek and disturbed soils would be revegetated following construction.

Moving Fortyfour Horse Camp from its present location to the new location 0.5 miles upslope would improve habitat. The new camp location would be along an existing logging road on a ridge farther from the creek than it is now. No new soil disturbance would be required to build the new camp except for digging the toilet pit. The Copper

Creek backcountry campground would be located within a few hundred yards of the creek but would not be located immediately adjacent to it. NC steelhead have been noted near the mouth of Copper Creek. Only minor ground disturbance would be required at the camp in order to create flat sleeping areas and dig toilet pits. Pollution from human waste would be prevented by the installation of the pit toilets. Standard erosion control measures mentioned above for trails and trailheads would be implemented at each backcountry site. Sedimentation is expected to be absolutely minimal from the construction of the Coyote Creek backcountry campground.

The regular annual maintenance of proposed foot and horse trails not located on existing roads would not affect habitat because no new ground disturbance is involved. Only the clearing of encroaching vegetation and drainage structures is necessary during regular maintenance of these types of trails. Cyclic maintenance (done every five years) includes the reshaping of any foot or horse trail treads to remove berms and reestablish proper drainage. This work is done entirely with hand tools and affects a limited area. Cyclic trail maintenance only involves the existing exposed trail tread in dispersed locations along the trail. No new soil areas would be disturbed and all tread areas that are reshaped would also be re-compacted resulting in no new soil movement. The maintenance techniques of proposed bicycle trails that would be established along existing maintained roads (B-Line Bike Loop—trail L, Coyote Creek Bike Loop—trail U) have been analyzed under a previous consultation on the RNSP annual road maintenance program (NMFS BO, March 4, 2003, file no. 151422SWR02AR6347).

Adverse effects on critical habitat elements from trail, trailhead and backcountry camp construction primarily from extremely minor sedimentation would be negligible because of the avoidance and minimization measures and best management practices described above. Increased human access to areas of Redwood Creek upstream of the Tall Trees Grove is anticipated to have negligible to moderate adverse effects on individual summer steelhead trout.

Essential Fish Habitat for CC Chinook, SONCC coho and NC steelhead would not be affected by any of the proposed actions. Negligible amounts of sedimentation may occur during foot bridge construction. The adverse effects on Essential Fish Habitat from sedimentation would be temporary, localized, and negligible to minor.

Methodology for Analyzing Effects on Threatened Birds—The area in which effects on threatened and endangered species were analyzed in the BA submitted to the USFWS (Bensen 2006b) is the maximum effect area of all species potentially impacted by existing developments and dispersed use areas as well as additional areas potentially impacted by the proposed action throughout RNSP. This area is approximately 35,860 acres, or roughly one-third of RNSP. State park lands were included in the analysis because the state parks are managed cooperatively with the national park, and endangered species habitat is contiguous among all four individual park units.

Protocol surveys are conducted for northern spotted owls and marbled murrelets in some areas of the parks. Because of the difficulty of determining the nesting status of marbled

murrelets, forest stands are surveyed to determine whether murrelets occur in these areas, and the presence of murrelets is used to indicate nesting status. The quality and amount of residual habitat within an area is quantified using geographic information system (GIS) computer models. Similar GIS models were also used to quantify and predict effects on northern spotted owls. This residual habitat GIS model was used to quantify the amount of potentially suitable habitat within the project area, quantify degraded habitat, and determine where to conduct surveys for owls and murrelets. The survey results and habitat data are combined to quantify and analyze impacts on marbled murrelets and owls from noise, disturbance and vegetation removal.

During a previous consultation on a trail construction project in the Skunk Cabbage Memorial Groves (refer to USFWS BO file no. 1-14-98-145) an average distance of 150 feet was used to approximate a visual disturbance distance (Wallen and Mayle 1998) and one-quarter mile was used to measure the effects of above ambient noise. Data from subsequent research and analyses of noise effects on nesting birds indicated that the one-quarter mile distance was a conservative number and that 500 feet is adequate to protect nesting birds from noise disturbance from powered hand tools, e.g. chainsaws and weed eaters. The results of analyses in this plan are based on the more conservative one-quarter mile distance but the 500 feet buffer is currently being used in the parks and will be used for any future construction based on proposals in this plan.

Birds—Listed birds that could be affected by proposals under any of the alternatives are brown pelicans, western snowy plovers, northern spotted owls and marbled murrelets. Bald eagles were listed when the BA was prepared; potential impacts on eagles are discussed here because the birds continue to be protected under several laws other than the Endangered Species Act.

Impacts on threatened birds due to construction, maintenance and use of trails, trailheads, and backcountry camps might result from habitat loss, visual or noise disturbance to nesting birds, and an increased threat of predation in localized areas.

Measures that the NPS would take to avoid or minimize adverse effects from noise and visual disturbance during nesting seasons, loss of habitat, and increased predation threat for listed bird species, including northern spotted owls and marbled murrelets, are summarized below and described more fully in the NPS BA and USFWS BO on this plan (see Appendix G).

Habitat Loss—Trails are laid out to avoid having to remove large trees because the roots must be dug out after a tree is cut, and it is less work to route the trail around the tree than to remove the tree and its roots. Trees removed for trail construction would be no larger than 10" to 12" dbh to the greatest extent practicable. No trees larger than 18" dbh would be removed.

It is not possible to estimate the numbers or sizes of trees that might be removed until a preliminary trail route has been marked on the ground. Park biologists would inspect the

preliminary route to determine how best to lay out a trail to minimize or avoid adverse effects to listed bird species that might result from tree removal.

Potential bald eagle roost trees (greater than 18" dbh with a broken top or the presence of large stick nests) would be evaluated for signs of eagle use or the actual presence of eagles. No trees that are large enough to serve as bald eagle roosts would be removed for trail construction, because such trees are considered as attractive elements along the trail. It is safer and less expensive to build the trail around a large tree than to remove the tree to build the trail.

All proposed new trailheads would be located in areas currently adjacent to roads and previously disturbed by logging or construction of roads or residences. Most of the original tree cover, if any, was removed for the original construction. The Wilson Creek trailhead site (all action alternatives) is within sight and sound of Highway 101. The Wilson Creek trailhead might use a portion of what was formerly Rudisill Road or Myrtle Avenue, both of which served residences occupied as late as 1993. The Alder Camp Road trailhead (Alternative C only) and Whiskey 40 trailhead (Alternatives B and C) would require removal of small alder trees or conifers that regrew or were aurally seeded following road construction or logging, respectively. The three sites for proposed trailheads along the WSAR (A-9 trailhead proposed under all action alternatives, the other two under Alternative C only) are along old logging roads in previously logged areas. The proposal to redesign and enlarge the Lyons Ranch trailhead (all action alternatives) would affect Bald Hills grassland, which is not suitable nesting habitat for any listed bird species.

The construction of new visitor use facilities adjacent to suitable murrelet habitat would cause some additional indirect negative effects in addition of those created by existing visitor use developments. Proposed developments have been located to decrease the severity of the additional negative effects. New trails located along habitat edges should have less of an indirect effect than new trails located in core habitat areas. Minimization measures listed in the NPS BA have been designed to reduce the adverse effects on murrelets from potential corvid predation and noise and visual disturbance. None of the backcountry camps in the proposed action (Alternative D), presumably the greatest potential new source of anthropogenic food, are located within 0.25 mile of suitable murrelet habitat. The proposed A9 Deck and Lyons Ranch trailheads (Alternative D, the proposed action) are located outside of suitable murrelet habitat.

None of the trailheads or backcountry camps are located in suitable spotted owl habitat and thus there is no possibility of habitat removal or degradation from the construction of these facilities. Trails A, G, L, M and X are partially or entirely located within suitable spotted owl habitat. None of the proposed trails are within known nest groves or one-quarter mile of any known owl activity center. Construction of the proposed trails would not result in the removal of suitable spotted owl nesting or roosting trees because only trees less than 18" dbh would be cut with most less than 12" dbh. Trail construction may result in a temporary degradation of habitat from removal of some potential hunting perches and prey habitat. This degradation, however, would be minimal when compared

to the amounts of remaining surrounding available habitat. No nest groves of unknown territories would be degraded because protocol surveys would be conducted as part of trail layout prior to construction. No individual spotted owl territory would have more than a negligible amount of habitat degraded due to the linearity of the proposed construction. In old growth forest and suitable mature second growth forest areas (more than 40 years old), understory shrubs and tree limbs would be the primary vegetation cleared with few trees being removed. The few trees removed should not prevent spotted owls from utilizing the area because remaining trees would continue to provide sufficient foraging perches and prey habitat. No overstory canopy would be altered and thus canopy cover would not decrease after construction. In dense second growth areas, which provide marginal spotted owl foraging habitat (more than 30 years old), more trees would be removed but the remaining trees would continue to provide sufficient foraging perches and prey habitat.

Maintenance would not result in the removal or degradation of suitable spotted owl habitat components.

Loss of owl habitat for construction of backcountry camps would be negligible. No large trees would be removed for construction of backcountry camps. Camps would be sited and designed to avoid the removal of trees, which are desirable for shade and have esthetic value.

No tree that meets the criteria for suitable marbled murrelet nesting habitat (32" or greater dbh, with potential nest platforms with overhead cover and lateral branches more than four inches in diameter) including trees that provide cover to potential nest platforms would be removed for construction of any trail, trailhead or backcountry camp proposed in this plan. All trees that would be removed for construction of trails within suitable habitat areas are too short to provide cover for nest platforms (i.e. their canopies do not extend up to the level where nest platforms exist within large redwood trees – generally greater than 150 feet) (Herbert, pers. comm.). Therefore, there would be no effect to suitable marbled murrelet habitat under any alternative.

Noise and Visual Disturbance to Nesting Birds—Spotted owls, marbled murrelets and bald eagles can be disturbed by sudden loud noises to such an extent that a bird or nesting pair might abandon a breeding attempt, nest, or young. Sudden noises and noises that are measurably louder than ambient noise (noise that is the typical constant background noise for a given area) might be perceived by a bird as a threat, causing it to flee. Noises greater than ambient noise can also attract potential predators to a nest.

Ambient noise is commonly measured in decibels, which are assumed to approximate the way the human ear responds to noise. The quieter the background noise level against which an intrusive noise is projected, the greater the range over which the noise would be audible. An intrusive noise must be reduced about 15 decibels less than the background noise level before it becomes indistinguishable. Normal spoken human conversation is generally considered to be around 45 decibels or less. The background noise level at the junction of U.S. Highway 101 and State Highway 1 south of the Golden Gate Bridge in

San Francisco during evening rush hour has been measured at 64 decibels with a peak noise of 77 decibels from a diesel bus moving uphill. Typical noise levels associated with ground clearing and excavation using heavy equipment for construction are between 84 and 89 decibels. On a calm day in mature coniferous forest in the Pacific Northwest, ambient noise levels were measured at around 35 decibels with noise levels near small streams in the same forest at around 45 decibels.

Noise greater than ambient noise on any given site would occur during construction and from subsequent maintenance activities and visitor use of some trails or some portions of trails. The intensity and duration of noise and disturbance also depend on the amount of visitor use of a trail, trailhead, or backcountry camp. Noise and disturbance from power tools is generally greater than noise from hand tools and visitor use, although intense noises of short duration from hand tools such as from hammers may have a greater effect than repetitive noises caused by power tools such as battery-powered electric drills.

Two primary noise restriction measures are employed to avoid or minimize noise disturbance to bald eagles, northern spotted owls, and marbled murrelets from construction or maintenance that must be accomplished during nesting seasons. One method restricts the time of day or limits the duration of time that power tools or heavy equipment can be operated. A second method establishes the noise level allowed within a certain distance from suitable habitat.

For construction, maintenance, or other activities using power tools, 500 feet from the noise source is used as the distance within which noise-sensitive species might be adversely affected. This distance applies only to suitable habitat during the nesting season. Any construction, maintenance or use that occurs outside the buffer distance or is conducted outside the breeding seasons is considered to have no noise-related adverse effects on listed bird species. Noise that is less than ambient noise or noise from some hand tools is not considered to affect noise-sensitive species.

Work with heavy equipment or power tools performed within 500 feet of suitable bald eagle, spotted owl, or marbled murrelet habitat would be accomplished outside the nesting seasons (February 1 through July 9 for spotted owls for noise-related effects only; March 24 through September 15 for marbled murrelets for noise disturbance).

Daily limited operating periods (two hours after sunrise to two hours before sunset) would be required if heavy equipment and power tools must be operated at greater than ambient noise levels within 500 feet of suitable habitat during the spotted owl and murrelet nesting seasons. To reduce noise levels so that heavy equipment or power tools can be used throughout the year, the NPS requires newly purchased equipment to be fitted with mufflers or other equipment that minimizes noise output.

No noise disturbance to marbled murrelets would occur from construction work or maintenance because all work that produces noise above ambient noise (i.e. mechanized tool use) would occur outside of the seasonal noise restriction period. The only exception to this is the potential removal of two fallen old growth trees with chainsaws during the

seasonal noise restriction period along the East Side Trail (M) under all alternatives. Past experience has shown that this type of emergency maintenance only occurs every few years. It is estimated that 250 acres of suitable habitat could be disturbed annually by the removal of two fallen trees with chainsaws.

Noise disturbance from visitor use of proposed trails and facilities is not expected to be a direct source of measurable disturbance for marbled murrelets or northern spotted owls because neither visitors nor park staff generally produce noise above ambient levels that would cause the birds to flush from a perch, abandon a nest or avoid using suitable habitat. In addition, most visitor use occurs after late May, i.e. after the nest initiation period when nesting birds are most susceptible to noise disturbance.

Visual disturbance caused by the presence of humans on foot within suitable spotted owl habitat is not expected to cause owls to abandon or alter their use of the habitat. Based on research and experience with spotted owls within RNSP, it has been determined that pedestrian human presence along trails is not actually a source of detrimental effects. Even though pedestrian human use of existing facilities and trails is not believed to be a source of disturbance for spotted owls, it is unknown how "naïve" spotted owls may react to a new trail or facility placed within the immediate "visual range" (i.e. 150 feet) of an active nest tree. Therefore, the NPS would use protocol surveys to locate unknown active spotted owl activity center locations. Any activity center discovered would be avoided by moving the trail route outside of the visual range distance of the nest as determined by an RNSP biologist (i.e. at least 150 feet).

Marbled murrelets may or may not be visually disturbed by human presence near their nests. Researchers have come to contrary conclusions on the effects of visual disturbance of human presence or above ambient noises near nests. Nelson and Hamer (1995) noted that there may be some effects due to human presence near nests (though these were discussed in relation to nest predation and not abandonment) as did the USFWS (1997). In contrast, Singer et al. (1992, 1995) recorded murrelet nesting in the presence of significant visitor use of campgrounds and heavily used roads and trails. Hebert and Golightly's (2006) research of nesting marbled murrelets in RNSP also indicates that murrelets would not abandon their nests when exposed to experimental loud mechanical noises. They conjecture that noise and visual disturbance may not have a direct deleterious effect on nesting murrelets, which may habituate to human presence.

Due to the uncertainty of murrelet behavioral response to human-caused disturbance, it may be possible that visual disturbance caused by visitors using existing developments and dispersed use areas and noise caused by vehicles on park roads may flush some marbled murrelets from nests or cause murrelets to avoid suitable habitat areas. The distance from visitors and staff using these developments and dispersed use areas at which a murrelet may flush from its nest most likely varies widely between locations because of the different spatial arrangement of intervening visual barriers (e.g. tree branches, tree trunks, topography) (Wallen and Mayle 1998, Sakai 2003). This is especially true for murrelets at RNSP where most nests are greater than 150 feet from the ground in tall old growth redwood trees (Hebert pers. comm.).

An additional maximum 384 acres of suitable marbled murrelet habitat may be *visually* disturbed by visitor use within the next ten years depending on the construction schedule of the proposed trails and associated facilities. This equates to an additional 0.9 percent of the 41,000 acres of suitable murrelet habitat available in RNSP. Again, disturbance associated with these acres was used as part of the final effects determination in the NPS BA (Bensen 2006b) because of the completely overlapping indirect effect of increased predation threat occurring at exactly the same locations. Any areas of visual disturbance to murrelets from maintenance have been considered in conjunction with future visitor use discussed above.

Any areas of visual disturbance caused by construction workers have been considered in conjunction with future visitor use effects because the impacts were assumed to be the same (i.e. construction workers would be at the same locations as future visitors using the new developments – thus the effects completely overlap).

Predation Threat—Research has shown that nesting marbled murrelets are preyed upon by a wide variety of animals occurring in northwestern forests (J. M. Marzluff, personal communication, October 2002-January 2003). Corvid birds (jays, crows, and ravens) are the primary nest predators of marbled murrelets nesting near the edge of forests and near human developments (homes, farms, campgrounds, dumps, etc.). Due to their curiosity, corvids might be attracted by the noises humans make. Other studies have shown that corvids are attracted to human developments because of the many food sources found there. These studies have also shown that corvid predation of nearby marbled murrelet nests might increase with the amount of human food available at a developed site. Corvids forage preferentially in the immediate area around a development while they wait for additional human food. This preferential feeding pattern might, in turn, increase the threat of predation on murrelet nests because of the increased chance that a corvid might find a nest while foraging. Research indicates that the threat of corvid predation decreases the farther a murrelet nest is from a human development. The distance over which the threat of predation decreases depends on the size of the development and the likelihood that human food is present. For example, a campground would be expected to be more attractive to corvids than would a trail.

Results of the GIS analyses show that about one-third of the total available suitable habitat within RNSP is potentially being affected by an increased corvid predation threat near park developments. If it is assumed that human food waste is the primary source of supplemental food for corvids originating from these developments and that the supplemental foods are increasing corvid populations or altering foraging behaviors, then decreasing the amount of human food waste should decrease corvid activity near developments. RNSP has recently replaced all trash containers at existing developments within suitable murrelet habitat with bear proof (and thus corvid proof) containers which should decrease supplemental corvid feeding.

The new intensive education program being undertaken throughout RNSP should also help to decrease the amount of supplemental corvid feeding occurring within both the

front and backcountry. Finally, the removal of picnic tables from five visitor use areas and the elimination of dispersed camping along four miles of Redwood Creek gravel bars (all adjacent to or in suitable murrelet habitat) under an adaptive management system as described in the proposed action has the potential to further reduce the potential for an increased predation threat.

Maintenance of trails and backcountry camps generally would occur once a year, or as needed following severe storms that cause trees or large limbs to fall across trails or in camps. Maintenance is an occasional short-term source of noise and disturbance in any one place but is done annually if funding and personnel are available and if the work can be scheduled to avoid impacts to listed species. Many trails are maintained with power tools because the trails are constructed in second-growth forest or prairie where understory vegetation grows more densely and more quickly than in old-growth forest. Trail maintenance using hand tools allows greater latitude in when the work can be done because hand tools create less noise than power tools.

Some noise disturbance to spotted owls would occur from the maintenance of the proposed trails and facilities but this disturbance is not expected to have an adverse effect because all above ambient noise producing work (i.e. power tool use) would occur outside of the "regular" seasonal noise restriction period (i.e. work would occur after July 9 during the less sensitive late breeding season,). The only exception to this is the potential removal of two fallen old growth trees with chainsaws during the seasonal noise restriction period along proposed Trail M. Past experience has shown that this type of emergency maintenance only occurs every few years. It is estimated that a total of 250 acres of suitable habitat could potentially be disturbed each year by the removal of two fallen trees with chainsaws.

Increased predation threat to marbled murrelets from visitor use of trails and trailheads would occur primarily in daylight hours during the spring and summer months, usually on weekends.

Under Alternatives B and C, there could be up to 48 people on any given night at the proposed Miller Creek Camp along the East Side Trail (six sites), up to 40 people at the proposed Copper Creek camp (five sites), up to 32 campers at the proposed Counts Hill Prairie camp (four sites), and up to 32 people at the Skunk Cabbage camp (four sites) along the Coastal Trail, given a maximum party size of eight at any single campsite. Under Alternative C only, the Coyote Creek mountain bike camp could have up to 40 campers if all five sites are fully occupied. Under Alternative D (the proposed action), the Skunk Cabbage (four sites) and the Copper Creek (five sites) camps would be constructed. A maximum of 152 campers would be present on any one night in 19 sites in the 4 new camps proposed under Alternative B, 192 campers in 24 sites in five camps under Alternative C and up to 72 campers among nine sites in the two camps proposed under Alternative D.

Adding two new backcountry camps under Alternative C would potentially increase the number of visitors camping throughout the RNSP backcountry on any given night from a

current maximum of 360 at nine existing backcountry camps to 552 persons in 14 camps, a potential increase of about 53 percent over existing levels. Under Alternative B, the maximum number of people camping in 13 primitive camps throughout RNSP would increase by 42 percent. Under Alternative D, the capacity of the RNSP backcountry camps would increase by 20 percent.

The Coyote Creek backcountry camp proposed under Alternative C is within one-quarter mile of a spotted owl territory. The Coyote Creek trailhead proposed under Alternative C is about a mile from the same owl territory. Spotted owls also occur in woodland habitats and in some second-growth forests in RNSP and might be affected by construction and visitor use in these areas.

Recorded overnight use of the Redwood Creek gravel bars averaged 1408 campers annually between 1998 and 2002, an average of four people per day if use was distributed evenly throughout the year. If use was concentrated over 180 days between May and October, which is more likely because of warmer temperatures, less rain, and lower flows in the creek making camping on the gravel bars in the creek channel possible, the average rises to about 8 people per day. This number of campers is not significantly higher than the number of RNSP staff that might be working in the Redwood Creek basin or at other backcountry locations throughout the parks on any given work day. Thus, overnight backcountry use is anticipated to have minor impacts to marbled murrelets from an increased threat of predation over the long-term.

Human use is concentrated at trailheads and backcountry camps. Trailheads would be furnished with wildlife-proof trash cans or food storage containers as soon as funding becomes available to purchase these items. Backcountry camps are expected to be occupied for a minimum of eight hours at a time, and generally longer, with food preparation and consumption of at least one meal on-site. Backcountry campers would be required to obtain a permit, and would receive information about proper food storage so that wildlife is not attracted to the camp. Portable bear-proof food storage canisters for use in the backcountry are available from some visitor centers when campers get a camping permit. Wildlife-proof trash cans and food canisters would reduce but not eliminate the likelihood that scavengers would be able to obtain human food and continually visit those locations in hope of getting food.

No trailheads are proposed in old-growth forest. The Miller Creek backcountry camp is the only proposed camp near old-growth redwood forest. The Skunk Cabbage backcountry camp would be located in Sitka spruce forest. The proposed location of the Copper Creek camp is in second growth forest. The proposed Coyote Creek and Counts Hill Prairie camps would be located in oak woodlands. If surveys by RNSP biologists indicate that corvid populations are increasing in the vicinity of these camps, adverse effects on murrelets would be reduced by limiting the number of permits for use of these camps during murrelet nesting season.

Large groups that use park trails for special events such as the annual Coastwalk hikes along the Coastal Trail or equestrian endurance or group rides must obtain an NPS

special use permit. Issuance of these permits is subject to consultation under Section 7 of the Endangered Species Act and mitigation measures would be developed that are specific to each group, activity and location of the event.

Spotted owls and marbled murrelets will not be harmed or injured by existing or future visitor or staff use of RNSP developments because there is no possibility that a visitor or staff member walking, riding or driving on the ground could injure arboreal species like owls and murrelets. No harm is expected to come to marbled murrelets due to activities associated with the proposed action because no suitable nest trees would be removed or altered, thereby negating the possibility for injury to nestlings and adults. No harm is expected to come to spotted owls because all new development areas would be surveyed for spotted owls prior to construction. Any areas containing occupied nest trees would be avoided or if an occupied nest stand is discovered then no activities would take place between February 1 and September 15 in order to avoid harming recently fledged owlets.

Western Snowy Plovers and Brown Pelicans—Western snowy plovers and brown pelicans might be affected by construction, use and maintenance of proposed trails at Crescent Beach (H), beaches at Redwood Creek and Freshwater Spit (O) and the Gyon Bluffs segment of the Coastal Trail (R). These trails are proposed under all three action alternatives. There would be very little additional disturbance from a trail in these areas that already receive substantial visitor use or are adjacent to roads and highways.

All beaches accessible to visitors and RNSP staff provide suitable California brown pelican resting habitat. Pelicans do occasionally loaf along some of these stretches of beach, especially near the Redwood Creek and Klamath River (in groups of less than 200) (RNSP unpub. data). Visitors walking along these stretches of beach may impact pelicans by causing them to flush either into the ocean or to another section of beach. The temporary disturbance does not appear to cause observable harm, as evidenced by the return of the pelicans to the same loafing spot once visitors pass and by their persistence on these beach stretches year after year in relatively consistent numbers (RNSP unpub. data). In addition, the offshore rocks dispersed along RNSP's coastline provide nearby, abundant, isolated, undisturbed resting habitat and have been recorded as being consistently used by large numbers of pelicans as both loafing areas and night roosts for at least the past 25 years (Sowls et al. 1980, Carter et al. 1996, Capitolo et al. 2004, Bensen 2004). The apparent high use of the various offshore rocks and more isolated stretches of RNSP beaches as loafing and roosting areas indicates that sufficient resting areas for pelicans are available in RNSP outside of the high visitor use areas along Freshwater Spit and Crescent Beach. Visitor caused disturbance appears to have negligible adverse effects on brown pelicans in RNSP.

Park staff have never recorded brown pelicans during the last two years (RNSP unpub. data) utilizing Crescent Beach near trail H or the southern end of Freshwater Spit near the northern terminus of trail R. The closest known beach loafing site to Crescent Beach within RNSP is approximately 12 air miles south at the Klamath River mouth while the closest recorded loafing site to the northern terminus of trail R is approximately two miles north at the mouth of Redwood Creek (RNSP unpub. data). No loafing pelican

surveys have been conducted on the north end of Stone Lagoon spit near the southern terminus of trail R. It is unlikely that pelicans are using this section of beach to loaf because of the regular visitor use from the nearby Humboldt Lagoons State Park access point and parking lot. Visitors using trail R is not expected to increase foot traffic at the mouth of Redwood Creek because of the intervening two miles of beach is not easily traversed due to steep wave slopes and deep sand. The distance between the mouth of Redwood Creek and the apparent lack of pelican use of these beaches makes the likelihood of disturbance from trail R construction, visitor use and maintenance low.

Trail H would traverse the vegetated back dunes of Crescent Beach where loafing pelicans have never been recorded. Unless pelicans begin using this area in the future, the construction, use and maintenance of trail H would not cause an impact. Trail R would traverse a coastal bluff and only the termini would be near beaches.

Trails R and H are located near suitable snowy plover habitat. Due to the immediate proximity of these trails to suitable snowy plover habitat, trail construction, visitor use and maintenance activities could potentially disturb plovers if they were present. It is not expected, however, that these new trails will increase visitor use above existing visitor use levels on the nearby beaches. Surveys for snowy plovers might be required prior to projects on sandy beaches involving heavy equipment or large work crews that would be present during plover nesting season. If nesting plovers are found, any planned work would be postponed and the NPS would re-initiate consultation with the USFWS to develop measures to protect the birds. Plover nesting habitat components such as native dune vegetation would be avoided.

Western snowy plovers may be affected and are likely to be adversely affected from a low potential for injury or harm caused by visitors inadvertently trampling unknown nests or eggs while using suitable RNSP beaches. Western snowy plovers may also be indirectly adversely affected by an increased predation threat caused by visitors inadvertently leaving food scraps or feeding wildlife in or near suitable habitat areas and thereby attracting potential predators. Impact minimization measures described in the proposed action should diminish these adverse effects. Neither of these adverse effects to western snowy plovers is quantifiable.

Bald Eagles—Bald eagles might be affected by construction, use and maintenance of trails, trailheads or backcountry camps if the eagles select a nest site near these facilities. No existing known bald eagle nests or winter roosts occur within one-quarter mile of any proposed trails or facilities. RNSP staff survey portions of potential suitable habitat throughout RNSP for new bald eagle nests and winter roosts each year and would continue to do so. If any new nests or winter roosts are discovered within one-quarter mile of existing or proposed trails or facilities, the NPS would take actions to protect them (i.e. temporarily close the trail or facility) and enter into consultation with the USFWS.

One of the two known bald eagle nests is on a ridge a mile to the south of Orick and is located within one-quarter mile of the existing McArthur Creek Horse trail. The nest is

not visible from the trail because of a ridge between the trail and the nest tree but eagles perched on nearby trees may be able to see visitors on the trail. The nest has maintained very high fledging success despite the presence of the trail. Park biologists assume that the ridge prevents disturbance from visitors using the trail. The second nest is located near the existing Mill Creek Horse Loop Trail. Due to the successful reproduction this territory has experienced over the past four years while the trail was open to the public, park biologists and the USFWS have determined that the territorial pair are not adversely affected by nearby trail users. Thus, park managers have decided to keep the trail open. If any new nests or winter roosts are discovered within one-half mile of existing developments or dispersed use areas, NPS will temporarily close the section of trail or associated facility and enter into consultation with the US Fish and Wildlife Service. Neither of the two known bald eagle nests or winter roosts occur within one-half mile of any proposed trails or facilities. RNSP staff survey portions of suitable habitat throughout RNSP for new bald eagle nests and winter roosts each year in conjunction with other projects or as funding allows and will continue to do so. If any new nests or winter roosts are discovered within one-half mile of proposed trails or facilities, the NPS will temporarily close the trail or facility and enter into consultation with the USFWS.

Eagles generally forage near water bodies, such as Freshwater Lagoon, Redwood Creek, or the Klamath or Smith Rivers. Construction, maintenance and use of trails within one-quarter mile of either coastal areas [proposed trails H, O and R under all alternatives; I and J under Alternative C only] or the major creeks and rivers may affect bald eagles. Several proposed facilities near these water bodies are located in areas of existing heavy use such as Hiouchi (A), Crescent Beach (H) or Freshwater Lagoon and the Redwood Information Center (proposed trails O and R). Construction of these proposed facilities would not significantly increase the level of disturbance from human use at these locations.

Pacific fishers—The effects of small backcountry camps and large trailheads on fishers are unknown. The amount of human use may be such that existing RNSP backcountry camps and trailheads in suitable habitat are a source of disturbance. Alternately, the lack of electrical power (and thus the use of radios and other noise making devices), lower overall human presence and general low impact nature of backcountry campers and trailhead users may not be a sufficient enough disturbance to cause fishers to abandon suitable habitat. It is unlikely that the dispersed camping along Redwood Creek gravel bars is causing a measurable disturbance. Visitor camps along the Redwood Creek gravel bars are located in the open in areas naturally avoided by fishers.

No new major campgrounds or roads are proposed. The additional new trails are not expected cause additional disturbance to fishers. The new proposed backcountry campgrounds are all located in low quality suitable habitat (i.e. second growth less than 40 years old) which do not provide suitable denning or rest sites. The likelihood for disturbance, therefore, is low. The proposed new trailheads are all either in unsuitable habitat or located along the edge of RNSP near developed private land, with much greater sources of disturbance compared to the effects of a new trailhead. Construction and maintenance of new trails, trailheads and backcountry camps as well as the proposed

watershed restoration in Prairie Creek Redwoods State Park could partially disturb fishers nearby in maternal dens but seasonal noise restrictions would eliminate noise disturbance during the critical natal den period of use (March 24 to June 15).

None of the proposed trailheads or backcountry camps are located in suitable fisher habitat and thus there is no possibility of habitat removal or degradation from the construction of these facilities. Trails A, G, L, M and X are partially or entirely located within suitable fisher habitat. Construction of the proposed trails would not result in the removal of suitable fisher denning or rest site trees because only trees less than 18" dbh would be cut with the majority of trees to be cut to be below 12" dbh. No trees of this size class should have cavities sufficiently large enough to provide a den or rest site. Canopy cover would not be lowered during trail construction in old growth and mature second growth forest areas because clearance zones for trails would only extend up to ten feet by eight feet wide. Even in dense second growth forested areas where more trees would be removed per linear mile should have more than sufficient remaining over arching tree limbs to maintain suitable cover.

The Pacific fisher may be negatively affected and the negative effects would be measurable within the local population. The effects include possible noise disturbance of 2,169 acres of suitable denning habitat due to visitor and staff use of vehicles on existing, major RNSP roads as well as visitor and staff use of existing, major RNSP campgrounds and trailheads. Additional negative effects include the removal of 23 acres of suitable foraging habitat due to proposed watershed restoration work along the West Ridge Road, one acre of habitat degradation due to proposed watershed restoration work along the Ossagon Road as well as an unquantifiable negative effect from potential mortalities caused by vehicle strikes along major RNSP roads. None of the proposed maintenance activities would result in the removal or degradation of suitable fisher habitat components and thus there are no negative effects.

Cumulative Effects on Threatened and Endangered Species—The conclusions in the BOs issued by NMFS and USFWS for the proposed action accounted for effects on listed species from other Federal, State and private actions in the action area. The primary threats to aquatic and terrestrial species that resulted in species being listed as threatened or endangered include habitat loss from land use and development (marbled murrelets, northern spotted owls); and oil spills (marbled murrelets). Anadromous fish have declined as a result of loss, damage, or change to their natural environment due to habitat blockages from culverts and other instream structures, urbanization, mining, unregulated logging practices, dams, water development and road construction. For Redwood Creek, habitat damage from major floods exacerbated by unregulated logging and construction of the levees on lower Redwood Creek had significant adverse effects on anadromous fish.

To provide additional protection to summer steelhead in Redwood Creek, the NPS has requested that the California Fish and Game Commission enact a seasonal closure on recreational fishing between June and September in the 3.9-mile-long reach of redwood Creek between McArthur and Bond Creeks. The Commission has not granted this

request. The contribution of increased human use in Redwood Creek to cumulative long-term adverse effects on summer steelhead populations in Redwood Creek is not known.

Two federal candidate species, the mardon skipper butterfly and the Pacific fisher, could be affected by proposed trail-related work in the state parks that are part of RNSP.

Individual mardon skippers may be negatively affected by trail construction but trail construction should not measurably affect the local population. The effects are due to a small amount of disturbance from visitor and staff use of existing trails as well as a low possibility of some individuals being trampled by visitor and staff using existing trails. Surveys for this species would be conducted prior to construction in any areas with suitable habitat.

An unquantifiable negative effect on fishers would result from potential mortalities caused by vehicle strikes along major RNSP roads.

The adverse effects on EFH described in the NMFS BO result from instream work required for culvert removal and watershed restoration associated with conversion of the West Ridge Road in Prairie Creek Redwoods State Park to a trail. This action has been completed by the California Department of Parks and Recreation.

The NPS requested, and NMFS authorized, incidental take of SONCC coho salmon juveniles, eggs and alevin; CC Chinook salmon eggs and alevin; and NC steelhead juveniles for the short-term adverse effects from removal of the stream crossing on Prairie Creek for the West Ridge Road road-to-trail conversion in Prairie Creek Redwoods State Park. Reasonable and prudent measures and non-discretionary terms and conditions outlined in the NMFS BO were required for implementation of the West Ridge Road project.

Conclusions (Threatened and Endangered Plants)—There would be no effects on listed plant species, including beach layia and western lilies, under any of the alternatives.

Conclusions (Threatened and Endangered Fish)—The NPS determined that there would be no effect to CC Chinook or their critical habitat, SONCC coho or their critical habitat and NC steelhead due to the construction of trails, trailheads and backcountry campgrounds under the proposed action. Footbridge construction under the proposed action may affect but is not likely to adversely affect CC Chinook and their critical habitat, SONCC coho or their critical habitat and NC steelhead because the amounts of sedimentation caused by footbridge construction would be negligible.

The proposed action may affect but is not likely to adversely affect SONCC coho and NC steelhead because of potential minor disturbance caused by human swimmers in cold pool refugia in Redwood Creek.

The proposed action may affect but is not likely to adversely affect CC Chinook, SONCC coho and NC steelhead due to some minor disturbance caused by visitors observing spawning fish.

SONCC coho critical habitat may be indirectly affected but is not likely to be adversely affected by minor changes caused by potential increased visitor use of the Mill Creek Horse Loop Trail due to negligible amounts of increased sedimentation.

A currently unquantifiable, but very small number of SONCC coho salmon redds are likely to be indirectly adversely affected by visitors crossing the Mill Creek Horse Loop Trail north ford and subsequently trampling eggs and pre-emergent fry. This adverse effect is expected to be minor and likely would not occur every year, if at all. NMFS determined that use of the Mill Creek Horse Loop Trail connector would have insignificant or discountable effects on SONCC coho salmon.

As described in the BO file no. ARN 252422SWR2003AR8825, dated September 17, 2007, NMFS found that there would be insignificant or discountable effects on listed fish and their designated critical habitat from construction of trails, trailheads and backcountry camps; retrofit and relocation of a backcountry horse camp; and annual maintenance of these facilities provided these actions are implemented under the minimization measures described in the NPS BA.

Conclusions (Threatened and Endangered Wildlife)—The proposed action (Alternative D) would not affect leatherback sea turtle, green sea turtle, olive Ridley sea turtle, or loggerhead sea turtle. Oregon silverspot butterflies may be affected but not adversely affected by the loss of a negligible amount of unoccupied suitable habitat. California brown pelicans may be affected but not adversely affected by short term, temporary, human-caused disturbance of birds in low quality loafing habitat. Two known bald eagle nest territories may be affected but not adversely affected by negligible amounts of visual disturbance caused by visitors and staff using the existing McArthur Creek Horse and Mill Creek Horse Loop Trails. Thus, the effects of the proposed action on Oregon silverspot butterflies, California brown pelicans and bald eagles would be minor.

All alternatives, including no action, are expected to have negligible to minor adverse effects on listed bird species from habitat loss. Adverse effects from noise disturbance are expected to be negligible to minor because noise effects would be avoided or minimized by restricting human-caused disturbance and noise to periods when birds are not as susceptible to disturbance. There might be moderate adverse effects on marbled murrelets from an increased threat of predation caused by visitor use of trails and facilities. It is anticipated that the proposed trail construction described in this plan would have moderate adverse effects on northern spotted owls and marbled murrelets due to the increase in suitable habitat for these species that would be affected by construction and use of proposed trails in old-growth forest.

Loss of suitable habitat for threatened birds from construction and restoration is anticipated to be negligible or minor. No trees greater than 18" dbh would be removed

for construction. The maximum amount of habitat that would be removed to construct trails under the proposed action (Alternative D) would be about 33 acres of understory vegetation and trees generally smaller than 12" dbh, assuming ten-foot-wide corridors. The maximum amount of vegetation that would be removed under any alternative is about 87 acres under Alternative C, assuming ten-foot-wide corridors. Therefore, there would be no effect to suitable marbled murrelet habitat under any alternative.

All proposed construction that could create greater than ambient noise within 500 feet of suitable northern spotted owls or marbled murrelet habitat would take place outside the respective nesting seasons. Therefore, no listed bird species would be affected by noise disturbance from these activities. Only a small amount of annual maintenance work would be performed on the East Side Trail within noise-sensitive species habitat during the breeding seasons. Approximately 300 additional acres of habitat for marbled murrelets and spotted owls along the East Side Trail only would potentially be disturbed by loud noises caused by annual maintenance activities under all alternatives. An additional 166 acres of suitable, unsurveyed spotted owl habitat would be disturbed by vehicle noise when the 6.5-mile segment of the West Side Access Road is opened to the public.

Marbled murrelets are likely to be indirectly adversely affected by an increased nest predation threat from visitor and staff use of some proposed trails and trailheads as well as visitor and staff use of existing RNSP developments and dispersed use areas caused by visitors inadvertently leaving food scraps or feeding wildlife in or near suitable habitat areas and thereby attracting potential predators. Marbled murrelets are also likely to be directly adversely affected by disturbance of suitable habitat caused by visitor and staff vehicles traveling on existing RNSP roads. The NPS requested, and the USFWS authorized, incidental take for increased predation threat and noise disturbance effects amounting to 12,830 acres caused by existing visitor and staff use of park developments and an additional 1,188 acres from the proposed action for a total of 14,018 acres. Marbled murrelets are also likely to be adversely affected through the potential disturbance of suitable nesting habitat by emergency trail maintenance occurring on proposed trail M (for the clearing of two large fallen trees with chainsaws during the seasonal noise restriction period).

The total amount of spotted owl nesting, roosting and foraging habitat that would be degraded by trail construction is approximately 14.5 acres (0.02%) spread throughout more than 69,000 acres of suitable habitat throughout RNSP.

Spotted owls are likely to be adversely affected through the potential disturbance of suitable nesting habitat by emergency trail maintenance occurring on proposed trail M (for the clearing of two large fallen old growth trees with chainsaws during the seasonal noise restriction period). The NPS requested, and the USFWS authorized, 250 acres of incidental take for conducting emergency trail maintenance. Based on past trail maintenance records, it is not expected that these 250 acres would be disturbed every year. Spotted owls are also likely to be adversely affected by noise disturbance of suitable nesting habitat caused by visitor and staff vehicles on existing and proposed-to-

be opened RNSP roads. The NPS requested, and the USFWS authorized, an additional 2,225 acres of incidental take for this noise disturbance.

The overall effect on marbled murrelets and northern spotted owls from the proposed action would be moderately adverse due to increased threat of predation and occasional noise disturbance in suitable nesting habitat.

Effects of the Action Alternatives on Cultural Resources—This impact analysis applies to three basic types of cultural resources—archeological sites, ethnographic resources, cultural landscape resources (including individually significant historic structures)—and incorporates the methodology described earlier in this section.

Section 106 of the National Historic Preservation Act (NHPA) requires a federal agency to take into account the effects of its undertakings on “historic properties” that include any property eligible for inclusion in, or potentially eligible for inclusion in the NRHP, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The SHPO advises and assists Federal agencies in carrying out their section 106 responsibilities. The NPS consults with the Yurok THPO in lieu of the SHPO on any projects that occur within the boundaries of the Yurok Reservation in accordance with 36 CFR 800.2(c)(2).

Since the precise location of trails, trailheads and backcountry camps is not known at this time, NPS will conduct consultations under 36 CFR 800 prior to implementation for each trail, trailhead and backcountry camp selected for development. This will include public and tribal consultation as well as consultation with the California SHPO and/or the Yurok THPO. The ACHP would also be afforded a reasonable opportunity to comment.

Appendix H provides a preliminary impact assessment and anticipated affects to cultural resources and historic properties including archeological sites, resources of ethnographic significance, historic structures and cultural landscapes under NHPA with recommendations for further inventories and identification. The assessment provides recommendations for future planning efforts and consultation as well.

Proposals in this plan are anticipated to have negligible to moderate adverse impacts on archeological and historic resources, traditional cultural properties and cultural landscapes. Every effort would be made to avoid adverse impacts to cultural resources by routing trails and locating trailheads and backcountry camps away from known resources and sites that might be damaged by construction, maintenance, or visitor use. When avoidance is neither feasible nor prudent and the undertaking might result in adverse impacts, the NPS would determine appropriate mitigation in consultation with the SHPO, THPO and culturally affiliated American Indian group as appropriate.

The NPS would consult with affiliated American Indian tribes, including the Yurok Tribe and THPOs where appropriate, to develop the trail program in way that respects the beliefs, traditions and other cultural values of American Indian tribes that have ancestral ties to lands encompassed by RNSP. The NPS would consult with American Indian

groups on all actions that have the potential to affect cultural resources associated with that group. Should consultations indicate that any proposal would adversely affect Yurok or other American Indian cultural sites or interfere with traditional activities conducted in accordance with applicable laws and regulations, the NPS would work with affected tribes and the SHPO or THPO to develop appropriate mitigation strategies.

Visitor use would have negligible effects on cultural landscapes including historic structures. To prevent unintentional moderate or major adverse effects on historic structures from visitor use, trailheads would have signs and brochures available to inform visitors of the value of these resources and information about how to observe and enjoy these structures and their surrounding environments without damaging them.

Under Alternative B, trails A, G, H, L, M^B, O, P, Q2, R, U, W and X would be developed. In addition, trailheads at the Wilson Creek, Whiskey 40, A-9 Deck, Mill Creek Horse Trail and Lyons Ranch Trail would be developed. All but the backcountry camp at Coyote Creek and the West Side dispersed camping would be developed under this alternative.

Trails A, O, R and U have the potential for direct moderate adverse impacts to archeological sites, traditional cultural properties and cultural landscapes that are or are likely eligible for listing on the NRHP. Design and implementation of these trails would require detailed planning in order to avoid any adverse impacts. Trails L, M^B, P, Q2 and U have the potential to indirectly affect historic resources associated with the Lyons Ranches Rural Historic District from increased visitation and use. Development of the Lyons Ranch Trailhead has the potential to impact an archeological site in the vicinity however this impact is likely to be beneficial because it will relocate visitor activities off of the ridgeline. Overall minor to moderate, direct and indirect, adverse impacts to archeological sites, traditional cultural properties and cultural landscapes could occur from Alternative B.

Under Alternative C, all listed trails, trailheads and backcountry camps would be developed with the exception that the East Side Trail alternative M^C would be implemented in lieu of M^A, M^B, or M^D and Trail Q1 would be implemented in lieu of Q2. Impacts to cultural resources would be the same as for Alternative B with additional potential for direct moderate adverse impact to prehistoric archeological site CA-HUM-448 from the construction of trail Q1. Adverse impacts to this site may be avoidable with proper design and planning. Direct moderate adverse impacts to prehistoric archeological site CA-HUM-625 could also occur from trailhead construction associated with the Coyote Peak Road. Indirect impacts to Lyons Ranches Historic District structures and features could also be affected by increased visitation and use. Overall minor to moderate, direct and indirect adverse impacts to archeological sites, traditional cultural properties and cultural landscapes could occur from Alternative C.

Under the Proposed Action (Alternative D), trails A, G, H, L, MD, O, Q2, U, W and X would be developed. In addition, trailheads at Wilson Creek, A-9 Deck, Mill Creek Horse Trail and Lyons Ranch Trail would be developed. Backcountry camps would be

developed at Skunk Cabbage Creek, Copper Creek and Fortyfour Creek, and dispersed camping on Redwood Creek gravel bars would be available.

Under the Proposed Action, trails A, O and U have the potential for direct moderate adverse impacts to archeological sites, traditional cultural properties and cultural landscapes that are or are likely eligible for listing on the NRHP. Impacts to cultural resources from construction of the Lyons Ranch Trail trailhead are the same as for alternatives B and C. Indirect impacts to Lyons Ranches historic structures and features could be expected from the development of the backcountry camp at Copper Creek from increased visitation and use.

Cumulative Effects on Cultural Resources—Development of trails, trailheads and backcountry camp in the proposed action has the potential for direct and indirect, minor to moderate adverse impacts to cultural resources that are components of the Bald Hill Archeological District and the Lyons Ranches Rural Historic District which have been determined eligible for listing on the NRHP. In addition the proposed action may also affect archeological sites and traditional cultural properties that are associated with a recently documented archeological district along the Smith River that has not yet been formally determined eligible for the NRHP, but which evidence indicates is likely eligible. As a result, any adverse impacts to these resources could have cumulative adverse impacts to these archeological and historic districts. However, since specific trail, trailhead and backcountry camp design has not yet occurred it is possible that through proper design, consultation and planning these adverse impacts to these resources could be reduced to negligible or minor.

Conclusions (Cultural Resources)—Appendix H contains a complete summary of impacts to cultural resources that can be anticipated without site-specific layouts for each proposed trail, trailhead and backcountry camps for each alternative.

The proposed action (Alternative D), no action (Alternative A) and alternatives B and C could have negligible to moderate, direct and indirect adverse effects on cultural resources including archeological sites, traditional cultural properties and cultural landscapes. Historic structures and the features associated with the Lyons Ranches Rural Historic District could also be indirectly impacted by increased visitation and use. However, specific trail routes and designs for trailheads and backcountry camp designs have not yet been prepared. With proper consultation with NPS Cultural Resource specialists, the California SHPO, Federally recognized Tribes, the public and when necessary the Yurok Tribe THPO under 36 CFR800, most of these impacts are likely to be reduced to negligible or minor. Consultation under Section 106 NHPA and its implementing regulations 36 CFR 800 will be required prior to the implementation or development of any trail, trailhead, or backcountry camp.

Effects of the Action Alternatives on Visual Quality—Minor temporary adverse effects on visual quality and esthetics are anticipated at construction sites, particularly trailheads, from the presence of construction crews and equipment. For a short time following construction, visual quality along trails and at construction sites would be adversely affected by newly disturbed soils and vegetation that has been removed or damaged by

construction. This is a minor temporary localized impact. Visual quality improves quickly as soils recover from disturbance and vegetation grows back.

Trail alignments would be chosen to provide an esthetically pleasing experience for visitors within constraints of resource protection, safety and trail construction standards. Trails would be designed to incorporate views and scenic areas, and to pass near unusual features such as large rocks and trees, or displays of wild flowers, flowering shrubs such as rhododendrons, ferns and other attractive plants.

Trails constructed in old-growth forest and other undisturbed vegetation communities are more visually appealing to most visitors than trails constructed through previously clear-cut forests or heavily disturbed areas. Some areas of second growth forest were not thinned commercially after reseeding and lack the elements that contribute to the visual quality in old growth and other stands of second growth forests that were managed differently. About 0.25 mile of the Whiskey 40 interpretive trail (P) proposed under Alternatives B and C would be constructed in an exceptionally dense second-growth forest area along the Bald Hills Road. This trail would be specifically designed to aid in interpretation of the effects of commercial logging in what is now the national park and how the NPS is reducing those effects. Sections of other trails would be constructed on old roads through second-growth forest to provide access to more scenic areas while reducing new disturbance in old growth forests. Visual quality in previously clear-cut forests would improve as forests re-grow, but this improvement would take decades to centuries.

Vegetation that is removed for trail construction would be cut carefully and disposed out of sight of the trail to the greatest extent possible to improve the appearance of the finished trail and to provide a safe trail experience. Wherever possible, plants removed from the trail alignment during construction would be salvaged and replanted next to the trail to improve the esthetic qualities of the trail immediately after construction.

Trail bridges and site furnishings at trailheads would be constructed out of local materials and would be designed with an appropriate scale and colors to blend into the area.

There would be a localized temporary adverse effect on visual quality along the WSAR from vehicles that stir up dust that settles on vegetation adjacent to the road. This impact on visual quality would occur primarily from June through September when the road is dry and would persist until rain washes off the dust.

Effects of the Action Alternatives on Visitor Use and Experience—Connections and links between the four units of RNSP and between RNSP and national forest or county trails would be weak or non-existent under the no action alternative (Alternative A). No links between the Coastal Trail and inland trails such as the Kelsey Trail would be constructed in RNSP. Under the no action alternative, no pedestrian highway crossings would be designated for hikers seeking to travel continuously from the Coastal Trail to the inland trails. Hikers would cross Highway 101 wherever they could do so safely but would not be directed to any specific crossing point.

Additional trails in RNSP and construction of trail links between adjacent public lands would allow visitors to explore additional areas of the parks and create a sense of connection between RNSP and adjacent lands and communities. Short trails would link developed areas to natural areas and to other developed areas, allowing visitors to experience a variety of park resources and to enjoy recreational experiences that are available from a single starting point. The increased number of trails is anticipated to attract more visitors as the proposed trail segments are constructed. Visitors seeking longer hiking trails or backpacking opportunities would benefit from completion of the East Side Trail and new backcountry camps. Mountain bikers would benefit more under Alternative C than under the other two action alternatives because the proposed backcountry camp at Coyote Creek would be constructed only under Alternative C.

Completion of the Coast-to-Crest Trail links through RNSP would create significant recreational opportunity in the state with a 2400-mile-long trail loop around California. Under all action alternatives, proposed trail G would link the Coastal Trail to the Little Bald Hills Trail via the Mill Creek Horse Trail and Rellim Ridge hiking trail.

Conflicts between hikers and bicyclists on the proposed mountain bike routes are expected to be minimal because the roads to be designated as mountain bike routes are on old roads that are at least 10 feet wide with sufficient sight distance for trail users to see and avoid other users. The proposed B-Line Bike Trail (Trail L, all action alternatives), the Coyote Creek Mountain Bike Trail (Trail U, all action alternatives) and the Davison Ranch Mountain Bike Trail (Trail V, Alternatives A and C) are on old roads with sufficient sight distance for trail users to avoid each other. Under Alternatives A and C, the proposed Davison Ranch equestrian trail (Trail Y) would also be constructed on an old road with sufficient sight distance for hikers to avoid equestrians. The Davison Ranch equestrian trail (Trail Y, Alternatives A and C), Davison Ranch Mountain Bike Trail (Trail V, Alternatives A and C) and B-Line Bike Trail (Trail L, all action alternatives) traverse second growth forest. Most hikers choose trails through old growth, rather than second growth, so conflicts between trail users are not anticipated on the trails through second growth forest.

Trail bridges would be constructed across permanent streams to improve visitor safety and make crossing easier and more comfortable in wet weather. Some bridges would also be installed across intermittent streams for major trails such as the East Side Trail that are expected to be used during wet periods. Trail bridges allow year-round use of a trail by visitors who do not want to negotiate a stream crossing through the water. High flows generally occur during rainy seasons and periods when visitor use is expected to be low. Seasonal footbridges are installed across Redwood Creek and the Smith River near Stout Grove during low summer flows. The legislation expanding Redwood National Park prohibits installation of permanent footbridges across Redwood Creek.

Approximately 2.2 miles of fully accessible trails [Hiouchi Flat (A), Crescent Beach loop (H) and Redwood Creek Nature Trail (O)] would be constructed under all action alternatives, improving recreational opportunities for visitors of all physical abilities.

Accessibility would be further improved by providing fully accessible backcountry campsites that are barrier-free to the greatest extent possible. Trails would be designed to be barrier-free to the greatest extent possible to serve all populations, although it is not feasible to construct all trails to meet ADA-standards for grade and slope.

Trails with a greater elevation gain over a given distance are generally steeper and more strenuous than trails with a lesser change in elevation over the same distance. Changes in elevation over the length of the trail shown in the table should only be used to compare relative steepness of trails. Trails may have short sections of trail that exceed average steepness. The proposed Lyons Ranch and Bridge Ridge hiking loops on the east and west sides of Redwood Creek (Alternative C, trails Q1 and T) have the greatest overall elevation changes of about 2100 and 1900 feet, respectively, between the highest and lowest parts of the trails. The Lyons Ranch trail would be generally steeper because the 2100-foot elevation change occurs over about 3.8 miles, versus more than fourteen miles for the 1900-foot change in the Bridge Ridge loop.

Redesign of vehicle access into existing trailheads at Mill Creek Horse Trail and Lyons Ranch would improve visitor safety by improving vehicle ingress and egress (sight distance, turning radius) and vehicle circulation within the parking area. Redesigning these trailheads and delineating parking spaces would allow visitors to park vehicles more efficiently. Increasing visitor safety and improving operational characteristics in access roads and parking areas would improve the visitor experience.

The quality and convenience of a visit to the parks would be improved for equestrians by construction of a major new trailhead at the A-9 Deck on the west side of Redwood Creek designed specifically to meet the needs of equestrians. Stock watering troughs, corrals or hitching posts to confine stock temporarily and parking with sufficient space for parking and turning stock trailers would contribute to a positive experience for equestrians. Relocating the Fortyfour Creek Camp to the G-6-1 road would improve the camping experience because the existing site is very damp and the water source is inadequate to provide both potable water for people and water for stock. The existing camp is located directly on the trail. Relocating the camp would reduce the disturbance to campers from other trail users.

Stock users and their livestock are prohibited from damaging or removing park resources. Park rangers conduct routine patrols to monitor trailheads, trails and backcountry camps for signs of unintentional resource damage, as well as indications of illegal activities including vandalism. If resources are damaged by visitor use, or if human health or safety is being affected by visitor use or natural hazards that develop, RNSP staff would take steps to correct the problem and mitigate any damage to the greatest extent possible. In extreme cases, park regulations allow closures of areas to protect resources and human health and safety. Closure is a last resort if mitigation measures are judged to be ineffective.

Allowing dispersed camping on the west side of the Redwood Creek basin under Alternative C would allow visitors to choose campsites to their own liking. Visitors

seeking an off-trail or dispersed camping opportunity are more at risk of becoming lost. The risk is reduced somewhat because it is difficult for people to move through most park forests without trails due to steep slopes, frequent stream crossings and the dense vegetation and debris on the forest floor. Visitors using the WSAR for access to the backcountry or using trails in heavily logged areas where logging roads have not been removed would potentially be at risk of getting lost on an old logging road not intended for use as a trail. Directional signs would be installed for wayfinding and old roads would be gated, locked and signed to discourage unintended visitor access.

Requiring permits for all overnight use of the backcountry allows rangers to determine the general location and expected schedules of backcountry campers and to initiate search and rescue operations more effectively if needed. Some visitors might be inconvenienced by having to obtain the free permit if they arrive after the visitor centers are closed.

Opening the WSAR to public use would increase the vehicle traffic on the road. The road is a narrow and winding with some blind corners. During and after periods of heavy rainfall, some culverts and sections of the roadway have failed. These safety deficiencies would be addressed during the planning and design for the A-9 trailhead, because the WSAR would be the only access for private vehicles.

Visitors wishing to use trails and backcountry camps, particularly in the Redwood Creek area, during prescribed fire operations would be adversely affected if trails or camps are closed during the burn. There would also be adverse effects on visitors using trails or camps if smoke from prescribed fires moves into trails or camps. These impacts are expected to be temporary minor adverse effects, because the burns are conducted over a short period of time and approval for prescribed fires requires that smoke be managed to minimize adverse effects on human health and visibility. Visitors would be advised about the location and timing of prescribed fire operations when they obtain a backcountry camping permit.

Proposals in this plan are expected to have moderate benefits to visitors from increasing recreational and interpretive opportunities by adding more trails for all trail users, improving the operational characteristics of the Mill Creek and Lyons Ranch trailheads and providing additional backcountry camps. Alternative C (recreation focus) would have proportionately greater benefits for recreational trail users because more trails and backcountry camps are proposed under this alternative than under either Alternative B or Alternative D (the proposed action). There would be temporary minor adverse effects on visitors if trails are closed because of trail or bridge failures or because storms have brought down large trees or limbs that must be removed.

Cumulative Effects on Visual Quality and Visitor Experience—Visual quality in the park depends on the level of previous disturbance to old growth forests within what is now the park and to how much of the viewshed includes non-park uses, such as residential, commercial and transportation facility development or commercial land uses such as logging. Areas with the highest visual quality include park beaches and shoreline, old growth forests, stream corridors including Redwood Creek, the prairies and oak

woodlands in the Bald Hills and long-distance views from the Bald Hills. Areas of lower visual quality include road corridors through second growth forest such as the West Side Access Road and dense stands of unmanaged second growth forest.

Visitor experience within the park would be complemented by continued development of recreational opportunities in communities adjacent to the parks and in the region. Additional trails are being developed in Humboldt and Del Norte Counties, including a Humboldt Bay Water Trail; a proposed bike trail along Elk Valley Road in Del Norte County; and completion of several segments of the Kelsey Trail in the Smith River NRA adjacent to the park in Del Norte County. In addition, the General Plan amendment for the Mill Creek watershed now included in Del Norte Coast Redwoods State Park is expected to contain proposals for additional recreational activities including hiking, biking, equestrian and motor vehicle access.

Conclusions (Visual Quality and Visitor Experience)—None of the alternatives, including no action and the proposed action, would adversely affect scenic resources or visual quality in the park.

The no action alternative would result in the fewest new trails available to park visitors. Alternative C would result in the greatest number of new recreational opportunities available for park visitors, including trails, trailheads, backcountry camps and dispersed camping opportunities. Alternative B would have fewer new trails and camps than Alternative C but more of these facilities than under the proposed action (Alternative D).

The proposed action was developed to provide additional recreational opportunities in a variety of habitats and areas throughout the park with a minimum of adverse effects to significant resources, notably listed threatened bird species. Visitor experience would be improved under the proposed action by construction of new hiking and biking trails and backcountry camps. These facilities would moderately improve recreational opportunities in the park, particularly in concert with other recreational trails being developed in adjacent state parks, communities and on USFS lands.

Effects of the Action Alternatives on Park Operations—Park operations in areas of the park occupied by listed threatened or endangered species would be adversely affected if the amount of time available for construction and maintenance is less than the time needed for effective and efficient trail work. The amount of time available for construction and maintenance of trails, trailheads and backcountry camps in endangered species habitat is shortened by the interaction between the climate of RNSP and restrictions on where and when work may occur in order to protect endangered species. Construction and maintenance of trails, trailheads and backcountry camps in areas occupied by endangered species would be scheduled to minimize or avoid adverse effects on listed species.

Construction is more difficult during the rainy season, which generally extends from November through April, for several reasons. Less available daylight shortens the work day. Storms accompanied by high winds create hazardous conditions in the forests from

falling limbs and trees. Some soils become too wet for trail work, because personnel and equipment cannot negotiate steep or slippery areas safely, or work efficiently in muddy areas. Other soils are susceptible to deep rutting if construction equipment is driven through wet areas. Vehicle access required for some construction may not be possible or safe on wet muddy roads and some roads are closed for resource protection.

Saturated soils and soils left bare after construction during the rainy season are susceptible to erosion and run-off into streams. Excess sediment in some RNSP streams adversely affects listed fish species in these streams. To protect listed fish species and other aquatic resources from soil erosion and runoff from bare soils immediately after construction, trail tread construction would be scheduled for times when soils are not saturated or subject to an increased risk of erosion following excavation. When trails are constructed in areas where bare soils might erode into a stream or watercourse, all excavated soils would be moved to other locations along the trail where the soil cannot enter the watercourse. Additional erosion control measures include installing silt fencing between the excavation area and the watercourse, or covering exposed soils with duff or erosion-control blankets or matting.

Trail construction would occur primarily in the dry season prior to onset of the rainy season to avoid or minimize soil erosion and runoff from bare soils that might adversely affect listed fish species. To protect listed fish, little or no soil excavation next to fish-bearing streams would occur during the rainy season (generally November through April) or wet periods.

Several months of the dry season overlap with noise restriction periods established to reduce disturbance to listed bird species during their breeding seasons. Power tools and some types of construction equipment, including heavy machinery, create noise in excess of ambient noise in many locations in RNSP. Noise that results from human activities, e.g., use of power tools, in areas occupied by listed bird species during their breeding seasons is restricted to levels at or less than ambient noise levels. Hand tools generally create less noise than power tools. Use of hand tools significantly increases the time required to construct or maintain trails and increases the overall time that trail crews must be on site. Although some trails can be constructed and maintained with hand tools, maintenance following major winter storms frequently requires power tools such as chain saws to remove large fallen branches or trees. Power tools and heavy equipment must be used to construct or maintain some facilities, such as graveled parking lots at trailheads and the WSAR.

The best weather and working conditions for trail construction and maintenance occur between May and October because there is less chance of heavy rain and soils are dry. The best weather for trail work overlaps the breeding seasons for bald eagles (January through August), northern spotted owls (February through July) and marbled murrelets (late March through mid-September).

Only hand tools would be used to construct trails located within 500 feet of suitable spotted owl or marbled murrelet habitat when construction would occur during breeding

seasons (February 1 to July 9, March 24 to September 15, respectively), unless protocol surveys indicate the species is not present. Power tool use during breeding seasons would be excluded from areas within one-quarter mile of suitable habitat for these three species unless protocol surveys have cleared the area of any listed species presence. Any construction activity that requires pounding (i.e. hammering) would be done outside of the breeding seasons listed above, if generated sounds are determined to be above ambient levels. Trail maintenance along trails in suitable nesting habitat for listed birds during their breeding seasons would be postponed if power tools are needed. No more than two large trees per year that have fallen in the trail corridor would be cleared with chainsaws from the East Side Trail (M) and Lyons Ranch trail (Q) during the northern spotted owl or marbled murrelet breeding seasons.

Construction near the end of the rainy season allows vegetation to grow back along the trail edges while there is sufficient moisture remaining in the soil or from late season rains. Salvaged plants need moisture to survive the transplanting, but too much moisture makes work difficult or unpleasant. Vegetation that can become established before the onset of the next rainy season reduces the potential for run-off into streams from bare soils.

Trails that cross perennial streams or perennially wet areas would require construction of as many as 31 bridges under Alternative C, which take more time to design and construct and might cost more than construction of the trail itself. Additional trail bridges might be required across intermittent streams on major trails where crossing might be hazardous or where the trail would be unusable without a bridge.

The prescribed fire program in RNSP would be affected by construction of new trails and backcountry camps because protecting these facilities and visitors who might wish to use these facilities during prescribed fires requires additional planning and preparation prior to conducting prescribed burns. Constructing backcountry camps and additional trails in the Bald Hills prairies and second growth forests increases the potential for human-caused wildfires. Trails construction staff would work with fire management staff to design and construct trails with consideration of defensible fuel breaks in areas prone to wildland fires. Trails provide access to areas and can be used for access during prescribed and wildland fires. The RNSP prescribed fire program allows prescribed fires to be scheduled in specific locations called burn units. Trails that cross burn units would be planned and designed so that the trails can be used to an advantage for fire planning such as access or fire breaks rather than interfering with how prescribed fires are conducted. Fire management plans would include planning for possible wildland fires in areas crossed by trails. Contingency plans for trail closures and evacuation procedures in case of wildfire would be developed as part of site-specific trail planning and design.

Requiring permits for all overnight use in the backcountry would add to the workload of park staff in visitor centers and offices where permits are issued. Park staff would need to spend time issuing permits, explaining regulations and answering questions about backcountry use. Allowing self-registration at trailheads would reduce the staff time

needed for issuance of permits. The NPS would incur minor costs associated with printing permits.

Constructing additional trails, trailheads and backcountry camps, and opening the WSAR to public use would require additional law enforcement patrols to protect resources and ensure visitor safety. Opening the WSAR to visitor use would increase the potential for resource theft and damage and would increase the chance of visitors getting lost in the network of old logging roads and skid trails after leaving their vehicles. Gates would have to be installed to prevent visitors from driving on abandoned roads not intended for public access and additional signs would be needed to direct visitors on the correct trails.

Backcountry camps would be monitored during routine patrols to ensure that visitor use and activities like gathering wood for campfires are not adversely affecting resources or creating health or safety problems.

Adding about 28 miles of new hiking and bike trails to the existing almost 90 miles of trails would increase the hours of maintenance and the numbers of safety and law enforcement patrols needed. Maintenance and patrol costs could increase as much as 30 percent, based on the percentage increase in total trail mileage.

Conclusions (Park Operations)—The proposals in this plan are expected to have moderate adverse effects on park operations from greater workloads that increase fiscal costs. These adverse effects are anticipated as a result of increased workloads for trail crews and maintenance staff and their supervisors who design, construct and maintain trails; for maintenance and construction operations in some areas occupied by listed threatened or endangered species from delays and increased personnel costs; for interpretive staff who would issue backcountry permits in visitor centers; for law enforcement staff who conduct backcountry patrols, law enforcement, search and rescue, and other emergency operations; for resource management staff who plan and implement prescribed fires, endangered species surveys and consultations under Section 7 of the Endangered Species Act, and cultural resource surveys and consultations; and for law enforcement and resource management personnel who monitor effects of visitors on endangered species and their habitat. The increase in workload is expected to be greatest for maintenance staff who construct and maintain trails and for ranger and resource management staff who monitor the effects of increased visitor use on resources and protect resources from intentional and unintentional damage. The combination of weather and the requirements for protecting endangered species shortens the trail construction season in some areas and reduces the efficiency of construction and maintenance activities. The time and cost of constructing trails proposed in this plan is anticipated to be substantially higher in endangered species habitat than in locations that are not restricted by these weather and endangered species protection requirements. Adequate staffing to construct, maintain and monitor additional trails and backcountry camps, and monitor natural and cultural resources in the vicinity of these facilities would require additional funding, which is considered a moderate adverse impact on park operations.

Non-Impairment of Park Resources

The NPS is prohibited by law and policy from taking an action that will impair park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. This section describes potential effects on resources under the proposed action and why those effects would not impair park resources or values. The effects and the potential for impairment under the other alternatives are also discussed.

Non-Impairment of Air Quality and Air Quality Related Values—Adverse effects on air quality under the proposed action would result from temporary localized dust or vehicle emissions during routine maintenance and from dust and vehicle emissions from heavy equipment operations for construction of 27.5 miles of trails and 2 acres of soil disturbance for construction of trailheads. The activity that would produce the most dust under the proposed action is public use of the WSAR. Reduced air quality from use of the WSAR under Alternative D would be localized, temporary during the dry season and repeated annually. If the dust creates hazardous driving conditions, a dust palliative would be applied. The dust would remain on the vegetation until rains wash it off. The overall adverse effect on air quality from the proposed action is very localized for all activities; short-term during construction and repeated from maintenance, and negligible; and repeated, localized and minor from visitor use of the WSAR. Therefore, air quality and air quality related values would not be impaired by the proposed action.

Under the no action alternative (Alternative A), adverse effects on air quality would result from temporary localized dust or vehicle emissions during routine maintenance and from construction of about 24.5 miles of new trails. These adverse effects are negligible under the no action alternative. Therefore, the no action alternative would not impair air quality or air quality related values in the park.

The overall effects on air quality under Alternatives B and C are slightly greater than under the proposed action because Alternatives B and C require more construction than the proposed action, which would result in more soil disturbance (34.4 miles of trails under Alternative B and 72 miles under Alternative C). The effects would be short-term during construction and localized at work sites. These effects are adverse but negligible. Under Alternative C (the proposed action), a longer segment of the WSAR would be open to the public, which would generate more dust than other alternatives. However, the dust would be localized, would be produced only during the dry season and would not obscure any vistas or other scenic values. Therefore, Alternatives B and D would not impair air quality or air quality related values in the park.

Under all alternatives, including no action (Alternative A), air quality would be adversely affected by dust from maintenance of existing trails and graveled roads that provide access to trails and trailheads and from construction and maintenance of new trails, trailheads and backcountry camps, and by motor vehicle emissions related to access, construction or maintenance. Motor vehicle emissions are minimized by regular vehicle maintenance to meet air quality standards required for vehicle registration. Dust is localized and is greatest on graveled roads during dry periods, primarily between May

and October. Alternative A (no action) requires the least construction of new facilities and would not open the West Side Access Road to public use. Alternative C requires the most new construction and would open more of the West Side Access Road to public use than either Alternative B or Alternative D (the proposed action). Alternative B would require less new construction than Alternative C but less than the proposed action. The effects on air quality and air quality related values would be negligible from dust and vehicle emissions and temporary but repeated over the long-term. These effects are adverse but negligible and acceptable.

Reduced Impairment of Topography and Soils—The topography of large portions of the project area in the Redwood Creek basin is considered to be impaired by logging and the construction and existence of logging roads and landings. The soils themselves can be considered impaired in those areas where soil profiles have been altered but the effect on the integrity of the soil components is less than the effect of destroying the original placement of soil horizons.

There would be no major changes in natural topography or landforms for construction of any trail, trailhead or backcountry camp under any alternative.

Total soil disturbance under the proposed action (Alternative D) would be less than 40 acres throughout the national park, primarily along narrow corridors in previously disturbed soils. The adverse effects on soils would be localized, long-term and negligible, especially in comparison to the alterations to topography and damage to soil that resulted from unregulated logging and associated road construction prior to park establishment. Therefore, the proposed action would not further impair the topography and soils in the park.

Impacts to soils for construction of trails, trailheads and backcountry camps under Alternatives B and C would occur in narrow linear corridors or in a few areas of less than 0.2 acres widely spread throughout the park. Alternative C would result in the maximum potential soil disturbance of any alternative; fewer than 90 acres of soils throughout the park would be affected. Most construction would occur in soils previously disturbed by logging or road-building. Alternatives A (no action), B and C result in new soil disturbance in old growth forest to construct the East Side Trail (Alternative A— 4.1 to 9.5 acres; Alternative B— 5.5 to 13.7 acres; and Alternative C— 5.0 to 12.5 acres). Alternative C would also require an additional 3.7 miles of new disturbance in old growth forest to construct Trail T. The adverse effects on soils under Alternatives A, B and C would be localized, long-term and negligible, especially in comparison to the alterations to topography and damage to soil that resulted from unregulated logging and associated road construction prior to park establishment. Therefore, Alternatives A, B or C would not further impair the topography and soils in the park.

Significant geological resources would not be affected under any of the alternatives. Impacts to topography and soils would be limited to narrow linear corridors to construct trails and to very minor grading for trailhead construction under all the alternatives, including no action and the proposed action. Impacts to soils from maintenance of

existing facilities and maintenance and construction of proposed trails, trailheads and backcountry camps would occur almost exclusively in soils previously disturbed by logging or road construction. Trails and trailheads would be designed with adequate drainage and would be maintained regularly to minimize erosion of trail surfaces. The adverse effects on soils and topography under any of the alternatives would be localized, long-term and negligible. These negligible effects are acceptable.

Reduced Impairment of Water Quality—Water quality in Redwood Creek is designated as impaired for sediment and temperature under the EPA 303d TMDL process. There would be no improvement to the existing sediment- and temperature-impaired condition of Redwood Creek from any actions under any of the alternatives. None of the alternatives would affect water quality in Redwood Creek either beneficially or adversely. Thus, none of the alternatives would affect the impaired condition of Redwood Creek.

Water quality would be protected by implementation of minimization and avoidance measures, erosion control measures and best management practices listed in the NPS BA submitted to NMFS that are designed to avoid or minimize erosion and sediment delivery to protect aquatic habitat for listed threatened fish species. These measures would apply to all of the alternatives where construction would potentially affect streams occupied by listed fish.

Construction of trail bridges across perennial streams would potentially affect water quality from erosion of bare soils next to the streams. If all perennial stream crossings require trail bridges with abutments, less than 0.1 acre of stream banks would be affected for construction of all trail bridges required under the proposed action (Alternative D). Implementation of the best management practices, reasonable and prudent measures, and Terms and Conditions listed in the NMFS BO would reduce or avoid adverse effects on water quality. Therefore, the proposed action (Alternative D) would not impair water quality in the park.

The total area throughout RNSP affected by construction of bridge abutments under Alternatives A (no action) or B is less than 0.1 acre for all 12 bridges and about 0.14 acre under Alternative C for 31 bridges. Implementation of the best management practices, reasonable and prudent measures, and Terms and Conditions listed in the NMFS BO would reduce or avoid adverse effects on water quality. Therefore, Alternatives A, B or C would not impair water quality in the park.

Adverse effects on water quality from maintenance of existing trails, trailheads and backcountry camps, and from construction or maintenance of these facilities under any of the alternatives, including no action and the proposed action, would be minimized through application of best management practices to avoid or control soil erosion. Any construction near a perennial stream or anywhere where exposed soils could potentially erode into a stream would be implemented under the BMPs required under the NOAA BO. Adverse effects on water quality under any of the alternatives, including no action and the proposed action, would be minimized by facility design and application of best

management practices to control erosion, and would be negligible. These adverse effects would be acceptable.

Reduced Impairment of Floodplains and Wetlands—The floodplain of Redwood Creek and riparian wetlands were impaired by sedimentation resulting unregulated logging and road construction prior to park establishment and expansion. Some riparian wetlands were completely destroyed by road construction and landsliding related to logging and road construction. This impairment is being reduced slowly by watershed restoration within the park and by modern logging practices required under current state and federal regulations to protect water quality.

None of the alternatives would affect floodplains. Thus, none of the alternatives would impair floodplains or floodplain functions or values in the park.

There would be negligible effects on riparian wetlands under any alternative. These effects would result from disturbance to small areas of riparian wetlands for construction of trail bridges across perennial streams. If all perennial stream crossings require trail bridges with abutments, less than 0.1 acre of riparian wetlands would be affected for construction of trail bridges under the proposed action (Alternative D). A portion of a trail would be constructed as a boardwalk to provide access through a coastal wetland under the proposed action (Alternative D). The boardwalk would be constructed to protect the wetland functions and to provide a location from which to interpret the functions and values of the wetland area. Therefore, Alternative D (the proposed action) would not create additional impairments to floodplains or wetland functions and values in the park.

If all perennial stream crossings require trail bridges with abutments, the total area throughout RNSP affected by construction of bridge abutments under Alternatives A (no action) or B is less than 0.1 acre and about 0.14 acre under Alternative C. A portion of a trail would be constructed as a boardwalk to provide access through a coastal wetland under Alternatives B and C, as well as under the proposed action. The boardwalk would be constructed to protect the wetland functions and to provide a location from which to interpret the functions and values of the wetland area. Therefore, Alternatives A (no action), B or C would not create additional impairments to floodplains or wetland functions and values in the park.

Less than 0.1 acres altogether of riparian wetlands along small sections of some trails would be affected by construction of trail bridges under each of the alternatives, including no action and the proposed action. Adverse effects on riparian wetlands under any of the alternatives, including no action and the proposed action, would be minimized by facility design and application of best management practices to control erosion, and would be negligible. These adverse effects would be acceptable.

Reduced Impairment of Vegetation Resources—The logging of the old growth forest in Redwood National Park caused what is now identified as an impairment to park resources. Logging conducted between park establishment in 1968 was described in the

park expansion legislation as a “derogation of the values, and the purposes for which the park was established...” and was directly responsible for the expansion of the park in 1978. The vegetation has regrown but the ecological characteristics and functions of the original old growth forest continue to be impaired by the logging. The impaired condition would persist for centuries while the forest regrows and the watershed recovers.

Under the proposed action (Alternative D), 33.4 acres distributed throughout the park would be the maximum amount of vegetation affected for construction and maintenance of new trails, trailheads and backcountry camps. Most of this vegetation is in areas that were previously disturbed by logging or road construction. No old growth trees or trees greater than 18 inches dbh would be removed for construction. Vegetation to be removed would be primarily understory vegetation that is common throughout the parks and is that is regularly cut for routine maintenance in the park and throughout the region. Vegetation within the construction corridor would regrow within 2 years and would be completely recovered within 5 years. Therefore, the proposed action (Alternative D) would not impair vegetation resources in the park.

The maximum amount of vegetation that would be affected by construction and maintenance under the no action alternative (Alternative A) would be 28.9 acres. Under Alternative B, a maximum of 36.7 acres of vegetation would be affected by construction and maintenance. Under Alternative 3, a maximum of 87.2 acres would be affected by construction and maintenance. Alternatives A (no action), B and C result in new disturbance in old growth forest to construct the East Side Trail. Alternative A would require new disturbance of 4.1 to 9.5 acres in old growth forest; Alternative B—5.5 to 13.7 acres; and Alternative C— 5.0 to 12.5 acres. Alternative C would also require an additional 3.7 miles of new disturbance in old growth forest to construct Trail T. No old growth trees and no trees greater than 18 inches dbh would be removed for construction in old growth or any other vegetation type. Vegetation to be removed would be primarily understory vegetation that is common throughout the parks and is that is regularly trimmed for routine maintenance in the park and the region. Vegetation within the construction corridor would regrow within 2 years and would be completely recovered within 5 years. Therefore, Alternatives A (no action), B and C would not impair vegetation resources in the park.

Most of the vegetation that would be affected for construction of trails, trailheads and backcountry camps has already been disturbed by logging. Vegetation in undisturbed areas or in old growth forest that would be affected by construction is understory vegetation. No old growth trees would be affected under any of the alternatives. No trees greater than 18” dbh would be cut for any new construction under any of the alternatives and most trees to be removed would be 12 inches or less in diameter. Vegetation would be removed along a linear corridor for trail construction. The corridor would become narrower as vegetation regrows along the edges of the trail. The adverse effect on vegetation from clearing and maintaining 4-to-10-foot wide trail corridors primarily in previously disturbed vegetation throughout the park would be negligible under any of the alternatives. These adverse effects are acceptable.

Non-Impairment of Wildlife Resources—Individuals of small and less mobile wildlife species, primarily invertebrates and rodents, would be displaced or killed by removal of 34 acres of vegetation for construction under the proposed action (Alternative D). Most wildlife would move away from the construction site during daylight when construction occurs and would reoccupy the area when the disturbance ceases; maintenance of trails, trailheads and backcountry camps would have the same effect. Loss of these individual animals is not expected to adversely affect the overall population of any of these species in the parks as a whole. The effect on wildlife would be negligible. Therefore, the proposed action would not impair park wildlife resources.

Individuals of small and less mobile wildlife species that occupy several habitats in up to 28.9 acres under Alternative A; 36.7 acres under Alternative B; and 87.2 acres under Alternative C acres would be removed to construct trails, trailheads and backcountry camps would be displaced or killed by removal of vegetation in several habitats. Loss of these individual animals is not expected to adversely affect the overall population of any of these species in the parks as a whole. Most wildlife would move away from the construction site during daylight when construction occurs and would reoccupy the area when the disturbance ceases; maintenance of trails, trailheads and backcountry camps would have the same effect. The effect on wildlife would be negligible. Therefore, none of the alternatives to the proposed action (Alternative A—no action, B or C) would impair park wildlife resources.

The acreage of vegetation disturbed for trail construction for all of the alternatives ranges from 12 to 87 acres along linear corridors in a variety of vegetation types throughout the park. The loss of this area of vegetation spread throughout the park would have a negligible long-term adverse effect on wildlife populations. Non-discretionary terms and conditions from the USFWS and NMFS BOs to implement reasonable and prudent measures to avoid and minimize adverse effects on listed wildlife species and to reduce and monitor injury and mortality to listed threatened fish would protect other wildlife and aquatic species as well. Measures to reduce noise disturbance during nesting seasons include restrictions on the seasons and time of day that work is allowed and observance of a noise buffer. Limitations on the size of trees that can be removed would avoid or minimize adverse effects on habitat. These minimization measures would reduce adverse effects on wildlife from construction, maintenance and/or use of trails, trailheads and backcountry camps to negligible. These adverse effects on wildlife are acceptable.

Non-Impairment of Threatened and Endangered Species—Designated critical habitat for three species of listed fish may be affected under all alternatives, including the proposed action (Alternative D) and no action (Alternative A), but not adversely affected. Therefore, none of the alternatives, including the proposed action, have the potential to impair designated critical habitat for listed fish species.

The NPS determined that there would be no effect to CC Chinook or their critical habitat, SONCC coho or their critical habitat and NC steelhead due to the construction of trails (except for footbridges as described below), trailheads and backcountry campgrounds under the proposed action (Alternative D). Footbridge construction under the proposed

action may affect but is not likely to adversely affect CC Chinook and their critical habitat, SONCC coho or their critical habitat and NC steelhead or their critical habitat due to negligible amounts of sedimentation caused by footbridge construction.

The proposed action may affect but is not likely to adversely affect SONCC coho and NC steelhead because of potential minor disturbance caused by human swimmers in cold pool refugia in Redwood Creek.

The proposed action may affect but is not likely to adversely affect CC Chinook, SONCC coho and NC steelhead due to some minor disturbance caused by visitors observing spawning fish.

SONCC coho critical habitat may be indirectly affected but is not likely to be adversely affected by minor changes caused by potential increased visitor use of the Mill Creek Horse Loop Trail due to negligible amounts of increased sedimentation.

A currently unquantifiable, but very small number of SONCC coho salmon redds are likely to be indirectly adversely affected by visitors crossing the Mill Creek Horse Loop Trail north ford and subsequently trampling eggs and pre-emergent fry. This adverse effect is expected to be minor and likely would not occur every year, if at all. NMFS determined that use of the Mill Creek Horse Loop Trail connector would have insignificant or discountable effects on SONCC coho salmon.

As described in the BO file number ARN 252422SWR2003AR8825 dated September 17, 2007, NMFS found that there would be insignificant or discountable effects on listed fish and their designated critical habitat from construction of trails, trailheads and backcountry camps; retrofit and relocation of a backcountry horse camp; and annual maintenance of these facilities provided these actions are implemented under the avoidance and minimization measures described in the NPS BA. Implementation of the proposed action is not likely to jeopardize the continued existence of SONCC coho salmon, CC Chinook salmon, or NC steelhead and is not likely to destroy or modify critical habitat for any of these species.

The quality of anadromous salmonid spawning habitat in Redwood Creek is considered to be impaired by excessive sedimentation, loss of large woody debris and high temperatures. Rearing habitat and ecological processes in the Redwood Creek estuary have been impaired by the presence of flood control levees on lower Redwood Creek.

The proposed action (Alternative D) would not result in additional sedimentation to Redwood Creek nor would it alter the level of impairment created by other activities described under soils, topography and water resources. The proposed action would have insignificant or discountable effects on listed fish and their designated critical habitat provided these actions are implemented under the avoidance and minimization measures described in the NPS BA and the NMFS BO. Therefore, the proposed action (Alternative D) would not impair populations of threatened fish or their designated critical habitat.

Proposals under Alternative A (no action), Alternative B and Alternative C for construction of trails, trailheads and backcountry camps and use of the WSAR would have similar effects on listed fish to the proposed action. These actions under Alternative A (no action), Alternative B and Alternative C would not affect perennial streams and therefore, would not affect listed fish or their designated critical habitat. Alternative A (no action), Alternative B and Alternative C would not result in additional sedimentation to Redwood Creek nor alter the level of impairment created by other activities outlined above. Alternative A (no action), Alternative B and Alternative C would have insignificant or discountable effects on listed fish and their designated critical habitat provided these actions are implemented under the avoidance and minimization measures described in the NPS BA on the proposed action, as described in the NMFS BO cited above. Therefore, Alternative A (no action), Alternative B and Alternative C would not impair threatened fish or their designated critical habitat.

No designated critical habitat for northern spotted owls, marbled murrelets, or western snowy plovers would be destroyed or adversely modified under any of the alternatives. None of the alternatives would affect beach layia, western lily or western snowy plovers.

Oregon silverspot butterflies may be affected but not adversely affected by the loss of a negligible amount of unoccupied suitable habitat. California brown pelicans may be affected but not adversely affected by short term, temporary, human-caused disturbance of birds in low quality loafing habitat. Two known bald eagle territories may be affected but not adversely affected by negligible amounts of visual disturbance caused by visitors and staff using the existing McArthur Creek Horse and Mill Creek Horse Loop Trails. Thus, the effects of the proposed action on Oregon silverspot butterflies, California brown pelicans and bald eagles would be minor. The proposed action, Alternative D, would not cause an impairment to these species.

The proposed action (Alternative D) would not remove or degrade suitable marbled murrelet nesting habitat. Nesting murrelets associated with 3,763 acres of suitable habitat would be subject to harassment from construction, use and maintenance of new and existing facilities throughout RNSP, including facilities in the three state parks that are part of RNSP. Nesting murrelets associated with 11,539 acres of suitable habitat would be subject to increased predation risk. Ninety percent of this increased predation risk is associated with recreational use of existing facilities rather than new facilities that would be constructed under the proposed action. The majority of the increased predation risk is associated with the existing campgrounds in the state parks. The visitor education program proposed (Alternative D) and corvid management strategy are intended to decrease corvid predation of marbled murrelets near existing park facilities, including the state park campgrounds. If target reductions in corvid densities are not achieved by 2012, the NPS would consider more intensive corvid management techniques.

Based on the above effects that would occur under the proposed action, the NPS requested, and the USFWS authorized, incidental take for harassment of murrelets associated with 3,129 acres of occupied nesting habitat due to operation and use of existing facilities; harassment associated with 384 acres of occupied nesting habitat due

to operation and use of new facilities annually from the date of construction through 2017; harassment associated with 250 acres of occupied nesting habitat due to the use of chainsaws to clear a maximum of two fallen trees from the route of the proposed East Side Trail (M^D); harm associated with 10,289 acres of occupied nesting habitat due to an increased risk of corvid predation near existing facilities (primarily state park campgrounds in RNSP); and harm associated with 1,250 acres of occupied murrelet nesting habitat due to an increased risk of corvid predation near new facilities.

The proposed action (Alternative D) would result in removal of 24 acres of suitable northern spotted owl nesting and roosting habitat and would degrade 14.5 acres of suitable habitat. The USFWS anticipates that these impacts are insignificant because of the large amount and quality of the suitable nesting and roosting habitat that would remain in the project area. Nesting spotted owls associated with 2,475 acres of nesting and roosting habitat would be subject to harassment. Ninety percent of this increased predation risk is associated with future use of existing facilities and not facilities that would be constructed under the proposed action (Alternative D). New trail routes would not be located within 150 feet of any known historic or active spotted owl activity center to protect nests from disturbance. If an active owl nest is located within visual distance of the East Side Trail, the trail would be closed from February 1 through July 9 or rerouted.

Based on the above effects as a result of implementing the proposed action (Alternative D), the NPS requested, and the USFWS authorized, incidental take of an undetermined number of northern spotted owls. Incidental take is expected to be in the form of harassment associated with 2,059 acres of unsurveyed nesting and roosting habitat due to the operations and use of existing facilities; harassment associated with 166 acres of suitable, unsurveyed spotted owl habitat that would be subject to vehicle noise when the 6.5-mile segment of the West Side Access Road is opened to the public; and harassment associated with 250 acres of unsurveyed nesting and roosting habitat due to use of chainsaws to clear a maximum of two fallen trees from the route of the proposed East Side Trail (M^D).

The USFWS determined that the level of anticipated incidental take of marbled murrelets and northern spotted owls from implementation of the proposed action (Alternative D) would not be likely to result in jeopardy to the marbled murrelet or the northern spotted owl or destruction or adverse modification of critical habitat for these species. Therefore, the proposed action (Alternative D) would not result in an impairment to terrestrial species listed as threatened or endangered, nor would the proposed action cause an impairment to designated critical habitat for these species.

Under the no action alternative (Alternative A), as many as 9.5 acres of understory vegetation in old growth forest would be cleared to construct 8.5 miles of the East Side Trail alignment proposed under this alternative (M^A). Under Alternative B, up to 15.6 acres of understory vegetation in old growth forest would be cleared to construct 11.5 miles of the East Side Trail alignment proposed under this alternative (M^B). Under Alternative C, up to 15.5 acres of understory vegetation in old growth forest would be

cleared to construct 10.3 miles of the East Side Trail alignment proposed under this alternative (M^C). Under the proposed action (Alternative D), the East Side Trail would pass through about three miles of undisturbed old growth forest and adjacent to an additional three miles of old growth. Discussions with the USFWS during consultations on the full range of alternatives in this plan indicated the potential for impairment to threatened birds species, including northern spotted owls but primarily marbled murrelets, from increased threat of predation and habitat degradation associated with construction of the East Side Trail under Alternative A (no action), Alternative B and Alternative C. The USFWS indicated that construction of the East Side Trail through old growth forest had the potential to jeopardize the continued existence of marbled murrelets from significant adverse effects from construction, use and maintenance of a major trail through undisturbed old growth. The alignment of the East Side Trail under Alternative D was developed in consultation with the USFWS to minimize adverse effects on murrelets from new disturbance in large blocks of old growth forest compared to the East Side Trail alignments in Alternatives A, B and C. Therefore, Alternative A (no action), Alternative B and Alternative C have the potential to create an impairment to populations of threatened and endangered wildlife in Redwood National Park.

Adverse effects to listed threatened and endangered birds are related to the disturbance of 12 to 87 acres of habitat along linear corridors in a variety of vegetation types throughout the park for trail construction, maintenance and use under all alternatives, including no action and the proposed action. Non-discretionary terms and conditions from the USFWS and NMFS BOs to implement reasonable and prudent measures would avoid or minimize adverse effects on listed or candidate wildlife species other than marbled murrelets and northern spotted owls and would avoid, reduce or minimize injury and mortality to listed threatened fish.

All alternatives, including no action, are expected to have negligible to minor adverse effects on listed bird species from habitat loss, including marbled murrelets and northern spotted owls. Adverse effects from noise disturbance are expected to be negligible to minor under the proposed action because noise effects would be avoided or minimized by restricting human-caused disturbance and noise to periods when birds are not as susceptible to disturbance. It is anticipated that the proposed trail construction described in this plan under Alternative D (the proposed action) would have moderate adverse effects on northern spotted owls and marbled murrelets due to the suitable habitat for these species that would be affected by construction, maintenance and use of proposed trails in old-growth forest. The overall effect on marbled murrelets and northern spotted owls from the proposed action would be moderately adverse due to increased threat of predation and occasional noise disturbance in suitable nesting habitat. These adverse effects on threatened and endangered species under the proposed action are acceptable provided that the Corvid Management Strategy and Monitoring Summary described in the NPS BA (Bensen 2006a, NPS 2007) is implemented. One of the nondiscretionary Terms and Conditions of the USFWS BO is implementation of a corvid management strategy, which requires an adaptive management approach to reduce the density of corvids in and around park facilities if monitoring shows that corvid density continues to increase. Most of the adverse effects on marbled murrelets and northern spotted owls

from threat of predation and occasional noise disturbance result from use of existing facilities, especially the developed campgrounds in the state parks that are included within the boundary of Redwood National Park.

NMFS found that there would be insignificant or discountable effects on listed fish and their designated critical habitat under the proposed alternatives from construction of trails, trailheads and backcountry camps; retrofit and relocation of a backcountry horse camp; and annual maintenance of these facilities provided these actions are implemented under the minimization measures described in the NPS BA. Alternatives A (no action), B and C would have similar effects on listed fish as those under the proposed alternative because proposed facilities are not located near fish-bearing streams, or because facility design and best management practices for construction avoid or minimize adverse effects on stream habitat. Construction proposed under any of the alternatives may affect but would be unlikely to adversely affect listed fish. Therefore, any adverse effects would be negligible or minor and would be acceptable.

There would be more new development in old growth forests under the no action alternative (Alternative A), Alternative B and Alternative C than under the proposed action (Alternative D). The proposed action was developed in consultation with the USFWS to minimize adverse effects on marbled murrelets and northern spotted owls from the increased threat of predation and occasional noise disturbance in suitable nesting habitat. The NPS has determined that there is a potential for impairment to populations of listed threatened birds under Alternatives A, B and C. Therefore, potential adverse effects on marbled murrelets and northern spotted owls under Alternatives A, B and C would be greater than under the proposed action and are considered to be unacceptable.

Non-Impairment of Cultural Resources—No adverse effects to historic properties are anticipated from maintenance or use of trails, trailheads, or backcountry camps under any of the alternatives, including the no action alternative (Alternative A) or the proposed action (Alternative D). Therefore, there would be no impairment to cultural resources for these actions under any of the alternatives.

See Appendix H for a summary of potential effects on historic properties. Some actions under all alternatives have the potential to adversely affect historic properties. When site-specific planning commences in areas where historic properties might be adversely affected, the NPS will determine if the undertaking would affect historic properties. If historic properties would be affected, the NPS would initiate consultation with the SHPO, or THPO if appropriate, and determine how to protect historic properties. Proposed trails, trailheads and backcountry camps would be sited to avoid direct adverse effects to historic properties. Therefore, there would be no impairment to cultural resources under the any of the alternatives.

Non-Impairment of Visual Quality—None of the alternatives, including no action and the proposed action, would adversely affect scenic resources or visual quality in the park. Therefore, there would be no unacceptable impacts to visual quality or scenic resources. Visual quality and scenic resources would not be impaired by any of the proposals under

any of the alternatives, and none of the proposals under any of the alternative would create a potential for impairment to visual quality or scenic resources.

Coordination and Consultation on the Plan and Environmental Assessment

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- Don Beers, Park Maintenance Supervisor (retired), C DPR, Northcoast Redwoods District, Eureka, CA
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- Dick Mayle, Roads and Trails Foreman, NPS, Requa, CA (NPS team captain)
- Aida Parkinson, Environmental Specialist, NPS, Orick, CA (plan preparer)
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- Judy Wartella, Physical Science Technician, NPS, Arcata, CA (GIS analyses and maps)
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- Richard C. Sermon, State Park Superintendent (retired), Crescent City, CA
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Yurok Tribe

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- Tom Hofwebber, Senior Planner, Planning Division of the Community Development Services Department, County of Humboldt, Eureka, CA
- Jennifer Rice, Natural Resources Services, Redwood Community Action Agency (Humboldt County Trails Coalition steering committee), Eureka, CA

Public Distribution of the Trail and Backcountry Management Plan

The following elected officials, agencies, American Indian tribes and groups, and organizations, all in California, received a copy of the environmental assessment or a letter announcing its availability and where it could be accessed on the Internet. In addition, announcements of the plan were sent to individuals who have received copies of other park plans, who requested a copy, or who belong to organizations that received an announcement.

Congressman Mike Thompson
Assemblyman Wes Chesbro
State Senator Sam Aanestad
State Senator Patricia Wiggins
Chairperson, Del Norte County Board of Supervisors
Chairperson, Humboldt County Board of Supervisors

Big Lagoon Rancheria
Elk Valley Rancheria
Hoopa Valley Tribe
Resighini Rancheria
Smith River Rancheria
Tolowa Nation
Trinidad Rancheria
Yurok Tribe

Bureau of Land Management, Arcata Resource Office
NOAA Fisheries, Arcata Office
US Fish and Wildlife Service, Arcata Fish and Wildlife Office
Six Rivers National Forest Headquarters, Eureka
Gasquet Ranger District (Smith River NRA Headquarters)
US Army Corps of Engineers, Eureka
California Department of Fish and Game, Redding
California Department of Fish and Game, Eureka
California Department of Transportation, District 1
California State Office of Historic Preservation
Northcoast Regional Water Quality Control Board

Access Fund
Adventures Edge
Backcountry Bicycles
Backcountry Horsemen of California
Bigfoot Country Climbers
Blue Ribbon Coalition
California Coastal Conservancy
California Trout
City of Crescent City
Coastwalk
Crescent City/Del Norte Chamber of Commerce
Del Norte County Community Development
Del Norte County Parks Department
Del Norte County Recreation Department
Del Norte Economic Development Corporation
International Mountain Biking Association
Klamath Chamber of Commerce
National Parks Conservation Association
Northcoast Environmental Center

Redwood National Park
April 2009

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Northern Mountain Supply
Northwest Trail Riders, Inc.
Outdoor Store
Orick Chamber of Commerce
Orick Community Services District
Redwood Community Action Agency
Redwood Trails
Requa Inn
Trees of Mystery
Save-the-Redwoods League
Sierra Club North Group
Smith River Alliance

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ACRONYMS

ac-acre

ADA–Americans with Disabilities Act

BLM–U.S. Department of the Interior, Bureau of Land Management

CCT–California Coastal Trail

CDPR–California Department of Parks and Recreation

CG–campground

CSP–California State Parks

CT–California Coastal Trail

CFR–Code of Federal Regulations

dbh–diameter at breast height

DNCRSP–Del Norte Coast Redwoods State Park

E–equestrian

F–Fahrenheit

GIS–Geographic Information System

GMP–General Management Plan (National Park Service)

GP–General Plan (California State Parks)

H–hiking

H/C–accessible under the standards of the Americans with Disabilities Act

JS or JSRSP–Jedediah Smith Redwoods State Park

NCAP–North Coast Area Plan (Humboldt County)

NMFS–National Marine Fisheries Service (NOAA Fisheries)

NOAA Fisheries–United States Department of Commerce, National Oceanic and Atmospheric Administration Fisheries, aka National Marine Fisheries Service [NMFS]

NRA–National Recreation Area

NPS–National Park Service

PC or PCRSP–Prairie Creek Redwoods State Park

PCT–Pacific Crest National Scenic Trail

PL–Public Law

POC–Port-Orford-cedar

PRC–California Public Resource Code

RCAA–Redwood Community Action Agency

RSP–Redwoods State Park

RNSP–Redwood National and State Parks

USC–United States Code

USFS–United States Department of Agriculture, Forest Service

USFWS– Department of the Interior, United States Fish and Wildlife Service

USGS– Department of the Interior, United States Geological Survey

WSAR–West Side Access Road

Appendix A–Maintained Trails in RNSP

The following trails are currently maintained trails in RNSP. Trail lengths have been rounded to the nearest tenth of a mile. Trails on national park lands appear in **bold** type.

r.t. = round trip

TRAIL NAME	MILES	TRAIL NAME	MILES
Ah-Pah Trail	3.6	Lost Man Creek Bike Trail	10.2
Berry Glen/Lost Man Creek Bike Trail	1.0		
Boy Scout Tree Trail (one way)	2.8	Lyons Ranch Trail	2.0
Brown Creek Trail	1.2	Mill Creek Horse Trail	3.2
C.R.E.A. Trail	1.9	Mill Creek Trail (DNCRSP)	1.0
Cathedral Trees Trail	1.4	Mill Creek Trail (JSRSP)	4.5
Circle Trail	0.3	Miner's Ridge Trail	4.1
Clintonia Trail	1.0	Nature Loop Trail (DNCRSP)	0.5
Coastal Trail	43.4	Nature Loop Trail (PCRSP)	1.2
- Skunk Cabbage Section (101 to beach)	4.1	Nickerson Ranch Trail	0.8
- Gold Bluff Beach Section (beach to Ossagon trail)	6.2	Orick Horse Trail	34.0
- Carruthers Cove Section (Ossagon Trail to road)	2.6	- Ridge Loop	7.0 r.t.
- Coastal Drive Section (Carruthers to Flint Ridge)	4.7	- McArthur Creek Loop	14.2 r.t.
- Flint Ridge Section (Coastal Drive to Alder Camp)	3.7	- Elam Creek Loop	20.1 r.t.
- Klamath Section (Overlook to Wilson Creek)	6.4	- Fortyfour Creek Loop	32.3 r.t.
- DeMartin Section (101 to 101)	3.4	- Fortyfour Camp Spur	1.4
- Last Chance Section (101 to NPS/DPR boundary)	8.4	Ossagon Trail	1.6
- Nickel Creek Section (boundary to parking lot)	2.1	Peterson Memorial Trail	0.5
- Crescent Beach Section (parking lot to picnic area)	1.8	Prairie Creek Trail	4.3
Creekside Trail	0.2	Redwood Creek Trail	8.3
Damnation Creek Trail	2.2	Rellim Ridge Trail	3.2
Davison Hike-Bike Trail	2.9	Revelation Trail	0.3
Dolason Prairie Trail	5.8	Rhododendron Trail	7.8
Elk Prairie Trail	1.4	River Beach Trail	0.5
Ellsworth Loop Trail	0.6	Saddler Skyline Trail	1.2
Emerald Ridge Trail	1.2	Self Guided Nature Trail (JSRSP)	0.6
Fern Canyon Loop Trail	0.5	Simpson Reed Trail	0.7
Foothill Trail	2.2	South Fork Trail	0.9
Footsteps Rock Trail	0.5	Stout Grove Trail	0.5
Friendship Ridge Trail	2.8	Streelow Creek Trail	2.8
Hatton Loop Trail	0.2	Tall Trees Trail and Grove Loop	2.2
Hatton Trail	1.7	Trestle Loop Trail	1.1
Hiouchi Trail	2.0	Trillium Falls Trail	2.8
Hobbs-Wall Trail	3.2	Wellman Loop Trail	1.5
Hope Creek/Ten Taypo Trail	3.6	West Ridge Trail	6.8
Hostel/Hidden Beach Trail	2.7	Yurok Loop Trail	1.2
James Irvine Trail	4.5	Zigzag # 1 Trail	0.5
Lady Bird Johnson Grove Trail	1.3	Zigzag # 2 Trail	0.5
Leiffer Loop Trail	0.8		
Little Bald Hills Trail (RNP only)	4.5		
Little Creek Trail	1.0		

Appendix B—Proposed Trails and Trailheads in RNSP

All proposed trails selected from the list of 87 trails resulting from public scoping are listed here regardless of whether the trails would be on NPS or CDPR lands. Potential trailhead locations on state park lands and trails that might be removed in state parks are also listed. All construction is subject to site-specific planning and compliance under either NEPA or CEQA, as applicable, subject to the requirements of the responsible agency, and would be completed prior to approval for implementation.

- A. Hiouchi Flat Trail, ADA-accessible, 1.1 miles. NPS. This trail skirts the north bank of the Smith River to connect Jedediah Smith RSP campground with proposed Hiouchi Visitor Center and Hiouchi commercial area. No specific trailheads have been proposed to serve this trail. This trail might be constructed separately or in conjunction with a proposed NPS-CDPR visitor center at Hiouchi Flat across Highway 199 from the existing NPS information center.
- B. Aubell-Boy Scout Tree Trail-Hatton Trail connector, 8.0 miles. CDPR. This would be a major trail skirting the western edge of the Redwood Heritage State Wilderness Area in Jedediah Smith Redwoods State Park. This trail originates at the proposed Aubell Ranch trailhead, crosses the existing Boy Scout Tree Trail at Jordan Creek, skirts the northwest side of Redwood Heritage State Wilderness, crosses the west and south forks of Clarks Creek, and joins the existing Hatton Trail opposite Simpson-Reed Grove. It would link with the Hatton Trail to create a hiking loop around most of the state park. This trail would be served by proposed trailheads at Aubell Ranch and at Highway 199/Elk Valley Road.
- C. Camp Lincoln-Walker Hole connector, 1.8 miles. CDPR. This trail connects Camp Lincoln historic site with Walker Hole on the south bank of the Smith River. Camp Lincoln would serve as a trailhead on the western boundary of the state park.
- D. Lieffer-Ellsworth-Peterson Trail connector, 0.3 mile. CDPR. This trail connects the existing Lieffer Loop-Ellsworth trail with the Peterson trail by crossing Walker Road in Jedediah Smith RSP. It would link existing trails in Jedediah Smith Redwoods State Park to create a longer route. The existing trailhead on Highway 199 at the Simpson-Reed Grove would serve as the trailhead.
- E. Mill Creek Horse Trail-Little Bald Hills Trail connector, 4.5 miles. CDPR. This is one of three links needed to connect the California Coastal Trail at Crescent Beach with the Pacific Crest Trail in Siskiyou County via the Kelsey Trail. The other links between the Coastal and Pacific Crest trails are a portion of the existing Rellim Ridge-Mill Creek connector trail and proposed trail G (Rellim Ridge-Coastal Trail connector). This route requires further planning through CDPR's General Plan amendment process for the 25,000 acres in the Mill Creek watershed that were added to Del Norte Coast Redwoods State Park in 2004.
- G. Rellim Ridge-Coastal Trail connector, 1.7 miles. This trail creates a connection between inland trails and the California Coastal Trail at Crescent Beach. This is

- needed to link the Coastal Trail to the Pacific Crest Trail. A pedestrian crossing of Highway 101 would be established at the western end of this trail somewhere between Hamilton Road and Enderts Beach Road.
- H. Crescent Beach Hiking Loop, ADA-accessible, 0.7 mile. This trail creates a short, fully accessible interpretive loop in the Crescent Beach visitor use area. A boardwalk would raise the trail above the wetlands in the area and allow on-site interpretation of coastal wetlands and other coastal resources and processes. This trail would most likely be constructed in conjunction with redesign of the existing Crescent Beach picnic area, which would serve as the trailhead. The existing segment of the California Coastal Trail at Crescent Beach would be incorporated to create the loop from the picnic area.
 - I. Flint Ridge Loop West, 0.9 mile. In conjunction with the Flint Ridge Loop East (J, below) and the central part of the existing Flint Ridge Trail, this trail would create a loop route on Flint Ridge south of the Klamath River. A proposed trailhead at the junction of Alder Camp Road and Coastal Drive would serve the loop trail.
 - J. Flint Ridge Loop East, 1.7 miles. This trail would create a hiking loop in conjunction with proposed Flint Ridge Loop West (I, above) and a portion of the existing Flint Ridge Trail. A proposed trailhead at the junction of Alder Camp Road and Coastal Drive would serve the loop trail.
 - K. Coastal Drive Bypass Trail, 3.4 miles. This trail would create a hiking route parallel to the Coastal Drive between High Bluff Overlook and the northernmost trailhead for the Coastal Trail in Prairie Creek Redwoods State Park. This bypass trail would be a segment of the California Coastal Trail. The existing parking area at High Bluff Overlook or the proposed Alder Camp Road/Coastal Drive trailhead would serve this trail.
 - L. B-Line Bike Trail, mountain bike, 4.5 miles one-way. This road skirts the boundary of the national park in the Lost Man Creek watershed. The B-Line bike route would begin on the eastern park boundary where the existing Holter Ridge Bike Trail turns east and south, and would follow the former Simpson Timber Company B-Line [not the former Louisiana-Pacific B-Line west of Redwood Creek] along the park boundary where the Highway 101 bypass intersects with the old Cal-Barrel Road. Because of the safety and construction issues associated with establishing a trailhead in the vicinity of the controlled-access freeway, this route would not be a loop trail. The Lost Man Creek trailhead would serve as the trailhead for the B-Line bike trail.
 - M. East Side Trail, hiking, alignment and length vary under different alternatives. Trail M^A would run about 8 ¼ miles primarily through old growth forest between Lady Bird Johnson Grove and the Tall Trees Grove, as proposed in the 1999 RNSP GMP. M^B would skirt the edge of old growth forest wherever possible for about 12.9 from Lady Bird Johnson Grove to the Tall Trees Grove and continue beyond the

existing Emerald Ridge and Dolason Trails to join the Lyons Ranch Trail (trail Q2). M^C would run 12.8 miles through old growth forest wherever possible rather than on the edge of the old growth to join the Lyons Ranch Trail (trail Q1). M^D would run 7 miles through and adjacent to old growth from the junction of the Emerald Ridge and Dolason Trails to join the Lyons Ranch Trail (trail Q2).

- N. Stone Lagoon Horse Trail, 3.0 miles. This trail originates on state park land near a recreational facility on private land at Stone Lagoon and ascends the ridge toward the national park boundary on the west side of the Redwood Creek watershed. It would provide equestrian access to the horse trails and camps in the national park. This trail is intended to connect with the West Side Access Road and the A-9 deck trailhead in the national park on the ridge separating the Redwood Creek basin from McDonald Creek, which drains into Stone Lagoon. Completing this trail requires acquisition of private land separating state and national park lands.
- O. Redwood Creek Beach Nature Trail, ADA-accessible, 0.4 miles. This short interpretive trail would be a fully accessible boardwalk trail connecting the Redwood Information Center with the Redwood Creek Picnic Area. It would be part of the California Coastal Trail. The information center and the picnic area would serve as trailheads.
- P. Whiskey 40 Interpretive Trail, 1.0 mile. This trail creates an interpretive loop through the Whiskey 40 area and Gann's Prairie. It would connect with the East Side Trail and provide access to the East Side Trail from the Bald Hills Road. A proposed trailhead here would also serve East Side Trail hikers and backcountry campers using the camps along the East Side Trail. The proposed trailhead would also provide overflow parking for Lady Bird Johnson Grove, which would be reached by a short hike along the East Side Trail segment between the Whiskey 40 and the grove parking area.
- Q1 and Q2. Lyons Ranch Trail, 1.7 miles. This trail would connect the East Side Trail at the proposed Copper Creek backcountry camp to the Bald Hills Road by constructing a new segment between the camp and the existing Lyons Ranch Road. This trail would use the existing Lyons Ranch trailhead off the Bald Hills Road. Under Alternative C, an additional segment of trail would be constructed between the trailhead and the East Side Trail to create a loop (Q1).
- R. Gyon Bluff segment of the California Coastal Trail, 0.5 mile. This short trail would connect Freshwater Spit with Stone Lagoon in Humboldt Lagoons State Park. This trail would be a segment of the California Coastal Trail.
- S. Tom McDonald Creek Loop, 3.5 miles. This route creates a loop trail in the Tom McDonald Creek area on the west side of Redwood Creek, with low-water access across Redwood Creek to the Tall Trees Grove and Emerald Ridge trails. This trail would originate at the proposed trailhead north of the [former Louisiana-Pacific] B-5-2 road on the west side of Redwood Creek. The first part of the trail would be a one-

way route leading to a loop that runs along Redwood Creek across from the Tall Trees Grove. This trail provides access to the proposed dispersed camping area and would connect with the Bridge Creek Trail (T) described below.

- T. Bridge Creek Trail, hiking, 14.2 miles. This trail creates a hiking loop for access to the Bridge Creek basin and the proposed dispersed primitive camping area. Two new trailheads to serve this trail are proposed near the junction of the [former Louisiana-Pacific] B-Line and the Rodgers Peak access road. This trail would originate at the proposed trailhead on the West Side Access Road near Rodgers Peak Road. Like the Tom McDonald Creek loop (S) above, this trail includes a one-way section leading to a loop along Bridge Ridge and Bridge Creek.
- U. Coyote Creek Bike Trail, mountain bike, 5.8 miles. Ranch Road, Rock Fork Road, and Lower Rock Fork Road in the Coyote Creek watershed would be designated as a bike route in the Bald Hills area of the park. Bicyclists can travel on the Bald Hills Road to return to the Lyons Ranch Trailhead for a bike loop.
- V. Skunk Cabbage Ridge mountain bike loop, 4.2 miles. This loop trail would originate at the Elk Meadow trailhead and follow former logging roads, including a portion of the 205 logging road. The Skunk Cabbage Ridge mountain bike loop (V) was planned and approved through the 1996 Davison Ranch planning process, and would be designated as a bike route under NPS rule-making procedures.
- W. Berry Glen Trail, 2.1 miles. This trail would connect the Davison Trail along Prairie Creek and other trails originating at the Elk Meadow Trailhead with the Lady Bird Johnson Grove trail and the remaining proposed segments of the East Side Trail (M). The Berry Glen Trail begins at Highway 101 in the vicinity of Davison Road in the same location as one terminus of the Berry Glen-Lost Man Creek Bike Trail (Z) and ascends the slope below Lady Bird Johnson Grove to meet the existing grove trail that is part of the East Side Trail. The Berry Glen Trail would be the westernmost segment of the East Side Trail. This trail in combination with proposed trail X described below would create a link between the California Coastal Trail and the partially completed East Side Trail.
- X. Skunk Cabbage North Trail, 1.1 miles. The trail would begin at the Elk Meadow Trailhead and run along the north side of Skunk Cabbage Creek to meet the existing Skunk Cabbage Trail, which is a segment of the Coastal Trail. The Berry Glen (W) and Skunk Cabbage North trails would be the links between the East Side Trail and the Coastal Trail. This trail would connect to the Trillium Falls Trail and run from that trail along the north bank of Skunk Cabbage Creek to connect with the existing Skunk Cabbage segment of the Coastal Trail where it crosses the headwaters of Skunk Cabbage Creek. This new configuration would allow the Elk Meadow trailhead to serve as the primary trailhead for the Coastal Trail in this area and reduce the safety hazard for vehicles trying to turn left across Highway 101 at the thirty-five mile per hour curve at Robinson Road. The existing Skunk Cabbage Trailhead would be retained for additional access to the Coastal Trail.

- Y. Davison Ranch Equestrian Loop, 8.3 miles. This trail would originate from the horse barn across Davison Road from the Elk Meadow trailhead and loop around Skunk Cabbage Hill on former logging roads. The conceptual planning for this loop trail incorporated portions of the 210 and 220 roads, which were rehabilitated in 1996. Construction of the equestrian loop would require further planning to locate a suitable route using portions of logging roads and skid trails that have not been rehabilitated under the RNSP watershed restoration program.

National Park Trailheads Considered

Seven new trailheads are considered under the various alternatives.

- The Wilson Creek trailhead located on the east side of Highway 101 north of the mouth of Wilson Creek to serve the existing segment of the Coastal Trail and the DeMartin primitive camp. It would incorporate existing paved roads that formerly served private residences in this area or would be located at Wilson Creek. The Wilson Creek trailhead would have a capacity for three recreational vehicles (RVs) and seven passenger vehicles. The proposed new trailhead would be accessed from Wilson Creek Road if the new location does not use the existing abandoned roads.
- The A-9 trailhead constructed on a former logging deck located along the West Side Access Road. This trailhead would provide a staging area for equestrians and hikers using the west side horse trails and backcountry camps at Fortyfour Creek and Elam Creek. The A-9 trailhead would have a capacity for 15 RVs or trailers and 15 passenger vehicles.
- The Whiskey 40 trailhead along the Bald Hills Road in the Whiskey 40 area to serve the proposed Whiskey 40 trail (P). A segment of the East Side Trail (M^B) would connect Lady Bird Johnson Grove parking to the proposed Whiskey 40 trailhead. This trailhead would also serve as overflow parking for Lady Bird Johnson Grove or for visitors seeking a slightly longer hike than that currently available from the existing Lady Bird Johnson Grove parking area. The Whiskey 40 trailhead would have a capacity of 10-15 passenger vehicles. Because motorhomes and trailers are not advised on the Bald Hills Road due to steep grades and sharp curves, the trailhead would not be designed to accommodate large vehicles.
- The Coastal Drive trailhead at the junction of Alder Camp Road and Coastal Drive to serve the proposed Flint Ridge loop trails (I, J) and Coastal Drive Bypass Trail (K). There is an existing parking area at High Bluff that could serve the Flint Ridge loop but hikers would have to walk along Coastal Drive to reach the loop trails. Coastal Drive is a narrow unpaved motor vehicle road without shoulders or areas where hikers could step out of the traffic lane to let vehicles pass.
- The Coyote Creek trailhead off the Bald Hills Road at the junction of the Coyote Peak and Rock Fork roads to serve the proposed Coyote Creek bike trail (trail U). An alternative location for this trailhead is along the Bald Hills Road at the junction with Coyote Peak Road. A new trailhead at Coyote Creek would provide additional parking and another access point for the mountain bike trail. It would be closer to the proposed Coyote Creek bike camp than the existing Lyons Ranch trailhead, which is located about 2.5 miles to the northwest off the Bald Hills Road near the junction of

Lyons Ranch Road and Long Ridge Road. Long Ridge Road would be designated as part of the Coyote Creek mountain bike trail (U). This trailhead would accommodate at least 5 vehicles, based on the number of campsites at the proposed Coyote Creek backcountry camp. Large recreational vehicles and trailers are not recommended on Bald Hills Road, so the parking area probably would not be designed to accommodate large vehicles.

- A trailhead north of the B-5-2 Road on the west side of Redwood Creek, between the A-9 deck and Rodgers Peak access road, to serve the proposed Tom McDonald Creek Trail (S) and provide access to the proposed dispersed camping area. This trailhead would be about 8 miles from the A-9 Deck trailhead.
- A Rodgers Peak/WSAR trailhead on the west side of Redwood Creek located along the West Side Access Road about a mile east of the junction of the WSAR and the Rodgers Peak Road. The trailhead would serve the proposed Tom McDonald Creek (S) and Bridge Creek (T) trails and the proposed dispersed camping area. This trailhead would be about 9.8 miles from the A-9 Deck trailhead.

State Park Trailheads Considered

Additional trailheads are being considered to serve proposed trails in the following state park locations. Trailhead development would be subject to additional site-specific planning and compliance with the California Environmental Quality Act under state park planning requirements.

- The intersection of Highway 199 and Elk Valley Road to provide access to the proposed Aubell-Boy Scout Tree-Hatton Trail connector (proposed trail B), which would skirt the western edge of Jedediah Smith state park south of Highway 199.
- Aubell Ranch to serve the proposed Aubell-Boy Scout Tree-Hatton Trail connector (B). The County of Del Norte recommends in its 2000 *General Plan* update that a trailhead be constructed as part of future development of the Westlog mill site, which is located off Elk Valley Road between Aubell Ranch and Highway 199. The County proposal is not part of the RNSP trail plan proposal and is subject to future planning under Del Norte County planning regulations and codes. The trailhead would be constructed as part of the redesign of the existing offices and ranger station.

State Park Trails Considered for Removal

Several trails in two of the state parks are proposed for removal, closure or abandonment. If these trails are adversely affecting resources, they would be removed. Trail removal would be subject to additional site-specific planning and compliance with the California Environmental Quality Act under state park planning requirements. Otherwise, these trails would receive no further maintenance and native vegetation would be allowed to regrow in the trail corridor. Abandoned trails are considered closed. If needed, signs would be installed to warn visitors about trail closures. Unmaintained trails quickly become impassable as dense vegetation blocks the trail corridor.

About 7.3 and 0.4 miles of hiking trails would be removed in Prairie Creek Redwoods State Park and Del Norte Coast Redwoods State Park. The East Ridge Road (R5) in

Prairie Creek Redwoods State Park would no longer be maintained as either a road or a trail. This is essentially the current situation (no action) because the road is a very low priority for annual maintenance due to extremely limited visitor use of this trail compared to other trails in Prairie Creek Redwoods State Park.

- R1. Mill Creek (Campground) Trail, 0.4 mile. This trail in the Mill Creek Campground in Del Norte Coast Redwoods State Park would be removed. It has high maintenance and repair costs because it was constructed on a former logging road. This trail is located on the eastern bank of the West Branch of Mill Creek where a failure of the old roadbed would adversely affect threatened fish species.
- R2. Boat Creek Trail, 1.0 mile. This is a dead-end trail that runs parallel to the Friendship Trail in Prairie Creek Redwoods State Park.
- R3. West Ridge Road/Butler Creek, 1.9 miles. This trail in Prairie Creek Redwoods State Park was constructed on an abandoned logging road with extensive cuts and fills. There are other trails available in that lead to the same areas. Portions of West Ridge Road were removed or converted to trail in 2008.
- R4. Ossagon Road, 0.4 mile. This dead-end trail in Prairie Creek Redwoods State Park is constructed on an abandoned road. The Ossagon Trail now serves the area that was formerly accessed by the road. Removal of Ossagon Road was begun in 2008 and is scheduled for completion in 2009.
- R5. East Ridge Road, 4.0 miles. This trail was constructed on an abandoned road that became a dead end road when Ah Pah Road was rehabilitated. The trail receives little visitor use because of other trails in the vicinity.

Appendix C—Previous Park Trail Recommendations and Planning

Trails are one of the recreational opportunities many visitors seek in a park. Some trails are destinations in themselves while other trails provide access to park features or serve interpretive purposes. Trail systems can develop from historic trails and roads that predated a park, or can be designed and constructed specifically as a park experience or to reach a particular area. All trail types are found in RNSP.

Previous studies, reports, and plans about the RNSP trail system are summarized here in chronological order beginning with the establishment of Redwood National Park in 1968 and continuing up to the completion of the 1999 RNSP General Management Plan/General Plan.

Historic Roads, Trails and Transportation Routes

Historic trails in Redwood National Park were summarized in a report on area history completed shortly after the national park was established (Bearss 1969). The report recommended that several old roads and trails be preserved, interpreted, or re-established. Many of these recommendations have been carried out. Some observations from the study still pertain to modern trail planning and construction and are paraphrased below.

Historic trails afford an opportunity for interpreting man's struggle to cope with the environment. Trails were difficult to open and roads, until the advent of huge power earth-moving equipment, next to impossible to build. Roads and trail constitute an important and invaluable element in the story of man and the redwoods. This is a facet of the area's history that can be interpreted on site, because portions of the old trails and roads are extant. Important sites meriting preservation and interpretation are:

- the portion of the Crescent City Plank Road between U.S. 199 and Peacock's Ferry;
- Peacock's and Catching's [1/2 mile upstream of the mouth of Mill Creek at Hiouchi] ferries;
- the portions of the Kelsey Trail that are today's Bald Hill Road [in Del Norte County, not Humboldt County] in the area known as Little Bald Hills in Sections 22 and 23, Township 16 North, Range 1 East;
- the extant sections of the Crescent City-Trinidad Wagon Road along Damnation Ridge and Ragged Ass Hill [at Cushing Creek]—the remains on Damnation Ridge are especially interesting, because you can still feel the puncheons just below the surface; and
- the five miles of Redwood Highway constructed in the 1920s and abandoned in the 1930s, running along the cliffs and skirting the head of Damnation Creek.

The Kelsey Trail—The Kelsey Trail between Crescent City and Yreka is one of the oldest established trails in northern California. A continuing local interest in re-establishing this historic trail on its original route prompted two studies by NPS personnel in the early 1980s (Evanow 1980, USDI NPS 1983).

The earliest recommendations for trails in the national park were contained in an historic overview conducted soon after the national park was established in 1968. This overview recommended that historic trails important in the settlement of Del Norte County be located, preserved, and re-established if possible. Portions of three of these historic roads and trails—the Crescent City Plank Road, the Kelsey Trail, and the Crescent City-Trinidad Wagon Road—have already been incorporated into the RNSP trail system. Proposed hiking and equestrian trails in the vicinity of Howland Hill Road, the Mill Creek Horse Trail would connect to the modern Kelsey Trail. A proposed state park trail that would connect Camp Lincoln to Walker Hole would re-open part of the historic route from Crescent City to Jacksonville, Oregon.

A 1980 report on the Kelsey Trail described the original route as closely as could be determined from historic maps and descriptions, coupled with on-the-ground reconnaissance. In 1980, portions of the original Kelsey Trail had not been re-established or located since historical times. Since then, the South Kelsey Historical Trail and the Kelsey National Recreational Trail have been established through the Siskiyou and Marble Mountain wildernesses and other adjacent U.S. Forest Service lands. Trails through the Mill Creek acquisition would create a link between the Coastal Trail and the Pacific Crest Trail by connecting to the modern Kelsey Trail segments.

In 1983, Redwood National Park planners marked possible routes for re-establishing the Kelsey Trail through NPS land with the ultimate goal of connecting the Coastal Trail with the PCT. Much of the original Kelsey Trail alignment and historic fabric (primarily trail ruts and tree blazes) in what is now RNSP was obscured by logging and road development. The 1983 alignment approximated the historic route but incorporated grades more suitable to a modern hiking trail to provide a safer, higher quality hiking experience, lower maintenance costs, and fewer adverse impacts on sensitive soils and rare plants. A portion of the 1983 route became part of the current Little Bald Hills Trail.

In 1980, remnant sections of the original Kelsey Trail existed on USFS lands but had not been preserved or identified as a recreational hiking trail. Planned land uses on the historic route would have obliterated much of the historic trace. Creation of the Siskiyou and Marble Mountain wildernesses in the early 1980s ensured that most of the route was preserved. The USFS established the South Kelsey National Recreation Trail and the Kelsey National Recreation Trail on much of the original route.

The Kelsey Trail is a product of economic interdependence and cooperation between the pioneers of early-day Del Norte and Siskiyou counties. The trail was constructed in 1855 as the primary wagon supply route from Crescent City to mining camps in the Klamath Mountains near Yreka. The last commercial pack train used the trail in 1909.

The trail began to the south of Crescent City and proceeded up Howland Hill, crossing Mill Creek near the site of Nickerson Ranch by a route now mostly obliterated by road-building and logging. From Nickerson Ranch, the trail converged with another trail, and ascended “Bald Hill” [Little Bald Hills]. The Little Bald Hills Road was constructed on the bed of the original route for about three miles and is now incorporated into the Little

Bald Hills Trail in RNSP. From Little Bald Hills, the trail descended either to Rocky Ford on Rock Creek at its junction with the South Fork of the Smith River, or remained on the ridge and descended to the South Fork at Shallow Ford. Old maps used to determine the location of the trail in eastern Del Norte County are suspect because of fraudulent land surveys that were performed in the early 1880s.

The original route between Rock Creek and the start of the modern South Kelsey National Recreation Trail is affected by mining, logging, and South Fork Road along the river. About 12 miles southeast of Rock Creek, the USFS established the South Kelsey National Recreation Trail and South Kelsey Trailhead on the Upper South Fork of the Smith near Horse Creek. The trail crosses the Siskiyou Wilderness to Harrington Lake on the Del Norte/Siskiyou county line, follows the crest of the Kelsey Range to the wilderness boundary at Bear Lake, and descends to the Elbow Springs trailhead in the Klamath River drainage. The South Kelsey trail ends at the Elbow Springs trailhead. The original trail route has not been re-established between Elbow Springs and the beginning of the Kelsey National Recreational Trail.

Between Elbow Springs and the Kelsey National Recreation Trail, forest roads and state highway 96 provide access to the eastern and western segments of the original trail. Thornton Memorial Bridge now crosses the Klamath River at Independence south of Ferry Point. Only a short portion of the Kelsey National Recreational Trail near Titus Ridge is a hiking trail. The rest of the route is primarily on forest roads between the Klamath River and the Sulpher Springs and Norcross trailheads. From the Norcross trailhead, the trail ascends to Bear Lake where it intersects the Pacific Crest National Scenic Trail. After crossing the Pacific Crest Trail, the Kelsey Trail ends at the Kelsey Trailhead near the Kelsey Creek ranger station on the Scott River.

In 1983, NPS trail planners attempted to incorporate remnants of the Kelsey Trail into what is now the Little Bald Hills Trail. Parts of the original wagon trail were still visible but other parts had been incorporated into a motor vehicle road that was being converted into a hiking trail. The historic route passes in and out of RNSP lands. The original trail route was constructed strictly as a transportation route without regard to resource impacts or providing a pleasant esthetic hiking experience. The grades on the historic trail route are generally steeper than modern trail standards so the route of the Little Bald Hills Trail was moved off the Kelsey Trail route to accommodate hikers. NPS trail planners constructed a trail entirely within the parks that approximates the original route, is easier to walk and maintain, and is more esthetically pleasing.

The Trinidad Trail—Beairs (1969) identifies two “Trinidad Trails,” both constructed in 1850. One trail served as a supply route between Trinidad and the mines on the Klamath River. This trail used Indian trails and headed up the coast, turned inland from the eastern side of Big Lagoon, crossed Redwood Creek at the Tall Trees Grove, and continued to Elk Camp Prairie. From Elk Camp, the trail passed along the crest of the Bald Hills to French Camp, where the trail forked, one branch descending to the Klamath River at Martin’s Ferry and the other branch continuing into Hoopa Valley. The section of trail between Big Lagoon and Elk Camp was abandoned after construction of the Bald

Hills Road at the end of the 19th century. This portion of the trail from Elk Camp to the Tall Trees Grove was re-opened by Arcata Redwood Company in the mid 1960s following the discovery in 1963 of what at the time was the world's tallest tree. While the trail from Trinidad to the Klamath has lost its integrity where it was reopened by Arcata Redwood Company as a logging route, it still possesses historical significance.

Another "Trinidad Trail" eventually became part of the Crescent City-Trinidad Road. This trail paralleled the beach from Trinidad to the southern part of Gold Bluffs Beach. It then forked, with one branch continuing up the beach and the main trail ascending the ridge north of Major Creek, turning eastward at the Yurok village of Espau to Boyes Prairie, then swinging west and rejoining the other trail at the northern end of Gold Bluffs. The trail then paralleled the coastline as far as the mouth of the Klamath, on essentially the same route as today's Coastal Drive.

Jedediah Smith National Historic Trail Study—In 1984, the NPS studied trapper and explorer Jedediah Smith's 1828 route from San Jose, California to Fort Vancouver, Washington to determine if the route merited preservation and interpretation as a significant historic trail. Smith's route extended from the Sacramento and Trinity River Valleys along the Pacific Coastline, through the Smith and Willamette River Valleys to present-day Fort Vancouver National Historic Site, in Vancouver, Washington on the Columbia River. This trail, as well as Smith's 1826-27 routes through Idaho, Wyoming, Utah, Nevada, and southern California, was found to be ineligible for National Historic Trail status because Smith's routes did not become historic routes of travel with far-reaching effects on broad patterns of American culture, nor does the route have significant potential for public recreational use or historic interest based on historic interpretation and appreciation. The trail was found not to qualify for national scenic trail designation because much of the route passes through areas of private land in intensive economic use or through terrain generally not appealing or appropriate for the types of trail use intended to be provided on National Scenic Trails.

National and State Park Trail Planning Prior to the 1999 GMP/GP

Trails that now form the nucleus of the RNSP trail system were first proposed in earlier management plans. Early plans often describe trail routes that have been partially completed. Other proposals are still valid but were never constructed because of lack of funding. Some of these incomplete routes and proposals are included in this comprehensive RNSP trail plan. Plans that addressed trail planning and development are the 1985 Redwood State Parks General Plan, the 1984 Backcountry Trail Plan for Redwood and Skunk Cabbage Creeks, and 1996 Davison Ranch Development Concept Plan.

The East Side Trail—The 1978 legislation expanding Redwood National Park called for development of foot trail access to the Tall Trees Grove on the east side of Redwood Creek (PL 95-250 (16 USC §79m(b)(4), 92 Stat 171). This trail is referred to as the East Side Trail. The legislation specified that "one route shall, unless shown by the Secretary [of the Interior] to be inadvisable, principally traverse the east side of Redwood Creek

through the essentially virgin forest, connecting with the roadhead on the west side of the park east of Orick.”

The East Side Trail as envisioned in the legislation was a continuous trail route on the east side of Redwood Creek that traversed old growth forest. As a result of consultation with the USFWS under Section 7 of the Endangered Species Act, the NPS determined and the USFWS concurred that a new trail primarily through old growth redwood forest would adversely affect marbled murrelets and northern spotted owls. New segments of the East Side Trail in the proposed action were modified to reduce or avoid adverse effects on threatened bird species.

The Redwood Creek Trail was established in the late 1960s by converting former logging roads to a hiking trail. Although the Redwood Creek Trail provides a hiking route from “the roadhead on the west side of the park east of Orick” (PL 95-250; 92 Stat 171) to the Tall Trees Grove, much of the current Redwood Creek Trail is on the west side of the creek and does not pass through old growth forest, as envisioned in the park expansion legislation. The Redwood Creek Trail requires two creek crossings, which makes the trail unusable, unsafe, or inconvenient as a hiking route to the Tall Trees Grove when stream flows are high or when the temporary bridges are not in place during the summer season.

The Emerald Ridge trail in the vicinity of the Tall Trees Grove and the Dolason Trail are considered extensions of the East Side Trail because they provide foot access to the Tall Trees Grove. Although these segments are not part of the East Side Trail as it is described in the legislation, they are considered a continuation of the East Side Trail because they create a continuous hiking route along the east side of Redwood Creek.

1985 Redwood State Parks GP—The previous state park general plan called for a trail connection from Elk Valley Road to the West Rim Trail in Jedediah Smith Redwoods State Park, and for development of a trailhead in the Aubell area. CDPR is considering a trailhead at Aubell Ranch and a trail that skirts the western edge of the state park.

1984 Backcountry Trail Plan for Redwood and Skunk Cabbage Creeks—The national park backcountry trail plan guided development of trail based on concepts proposed in the first general management plan for Redwood National Park. The trail program focused on hiking and equestrian trails in the Skunk Cabbage and Redwood Creek basins in the southern part of the national park. Backcountry use in the Redwood Creek corridor including equestrian camps, dispersed camping, and camping on Redwood Creek gravel bars was established as described in the 1984 trail plan. The plan identified cultural resource concerns south of Mussel Point as an obstacle to routing the Coastal Trail through this area to connect with the Coastal Trail segment that ended at Skunk Cabbage Creek. The 1984 plan also discussed a problem linking the East Side Trail to the Coastal Trail in this area due to lack of park-owned land along Highway 101 where a highway crossing was needed. Nor did the NPS own the land identified as a potential crossing between Skunk Cabbage Creek and Berry Glen using the Arcata Redwood Company’s old log bridge over Prairie Creek. Since 1984, the NPS has acquired the land adjacent to

Highway 101 needed to link the Coastal Trail and East Side Trail, replaced the old bridge, and constructed a trail that incorporates the new bridge and terminates at Highway 101 opposite Berry Glen. This RNSP trail plan proposes to link the Coastal and East Side trails using a route first suggested in the 1984 plan.

The 1984 Redwood National Park Backcountry Trail Plan identified a problem attempting to link the Coastal Trail at Skunk Cabbage Creek with inland trails along Redwood Creek because of a lack of park-owned land needed to designate a Highway 101 crossing point and because of cultural resource concerns about the proposed trail route south of Mussel Point. The proposed Berry Glen hiking trail (W) would link the Coastal Trail with inland trails. The proposed state park equestrian trail (Trail N) between Stone Lagoon and the proposed A-9 trailhead on the western boundary of the national park would also serve as links between the Coastal Trail and inland park trails.

1996 Davison Ranch Development Concept Plan—In 1996, the NPS prepared a development concept plan in which a major trailhead and 22 miles of hiking, equestrian, and mountain bike trails were proposed for the Davison Ranch area. The Elk Meadow Trailhead was completed in 2001 on the site of the former Arcata Redwood Company Mill B. Two of the trails have been constructed, the Davison Trail, a bike-hike trail linking Prairie Creek Redwoods State Park to the Davison Ranch, and the Trillium Falls Trail through the old-growth redwood groves on Skunk Cabbage Hill, and the Berry Glen- Lost Man Creek bike trail.

In 1996, the NPS prepared a development concept plan for the Davison Ranch area in the southern part of the national park. The approved proposal included twenty-two miles of hiking, equestrian, and bicycle trails, with a major trailhead to serve these trails. The Elk Meadow Trailhead was constructed on the site of the former B-Mill deck and two of the trails originating there have been completed. One of the two trails is the 2.9-mile-long Davison Trail linking Prairie Creek Redwoods State Park with the Elk Meadow Trailhead; this trail on the old logging road along Prairie Creek is open to bicycles and hikers. The second trail is the 2.5-mile-long Trillium Falls Trail (hiking) through the redwood groves on Skunk Cabbage Hill. The NPS completed the Berry Glen Bike Trail between Berry Glen and the Lost Man Creek Road in 2004.

Appendix D—Regional Trail Planning

One of the purposes of the current trail planning effort is to establish links between RNSP trails and trails outside park boundaries. This section describes the links between existing and proposed RNSP trails and between RNSP trails and trails outside the parks. The trail alternatives in this plan connect to some of these regional trails to create an integrated trail system. All construction is subject to site-specific planning and compliance under either NEPA or CEQA, as applicable, subject to the requirements of the responsible agency, and would be completed prior to approval for implementation.

Del Norte County

A goal of the 2000 Del Norte County General Plan Update is development of a system of interconnected hiking, riding, and bicycling trails and paths suitable for active recreation, transportation and circulation. The Del Norte Local Transportation Commission updated the Del Norte County and Crescent City Bicycle Facilities Plan in 2002. Proposals in this RNSP trail plan are consistent with the goals of these plans and with the specific policies in the County general plan update. The following trails are described in current Del Norte County planning documents.

The California Coastal Trail north of Crescent Beach includes both pedestrian and bike routes along the coast on Del Norte County lands and in Crescent City. The County bike route follows existing roadways along the coastline and turns off Highway 101 onto Enderts Beach Road, where it enters RNSP.

The proposed Hobbs-Wall Multi-Use Trail would convert a former railroad right-of-way into a trail connecting downtown Crescent City (in the vicinity of RNSP headquarters building) to RNSP via Howland Hill Road. The goal of the trail is to enhance safety of pedestrians and bicyclists, including commuters; improve trail linkages between Crescent City and the parks; and provide a trail for visitors to explore Crescent City and Del Norte County destinations including the Elk Creek wetlands, Elk Valley Casino, and RNSP. The initial concept is a pedestrian and bike trail, with future plans for an equestrian segment from Elk Valley Road to Howland Hill Road, which could then connect to the Mill Creek Horse Trail.

A proposed “Coast-to-Caves Trail” for bicyclists and/or hikers would link the Coastal Trail at Crescent Beach in RNSP with Oregon Caves National Monument in southern Oregon via the Smith River National Recreation Area. This trail is included in the 2002 update of the Del Norte County/Crescent City Bicycle Facilities Plan. The trail would use Enderts Beach Road and Humboldt Road near Crescent Beach to reach Howland Hill Road, and continue over Howland Hill to Douglas Park Road and its intersection with South Fork Road. A new six-mile trail would be constructed on Smith River NRA land between South Fork road and Gasquet on the old route of Highway 199 (“Old Stagecoach Road”) on the southeast side of the Middle Fork of the Smith River. The proposed Hobbs-Wall Multi-Use Trail would intersect the Coast-to-Caves Trail at the corner of Howland Hill and Humboldt Roads, creating a link with downtown Crescent City.

Designating Douglas Park and South Fork Roads as bike routes would create a proposed bike route along the South Fork of the Smith River on South Fork Road from Douglas Park to Big Flat. Designating South Fork Road as a bike route creates a loop for mountain bikes through Little Bald Hills via Paradise Trailhead on South Fork Road to Little Bald Hills Trail and back to South Fork Road via Howland Hill and Douglas Park Roads.

The 2000 Del Norte County General Plan Update identifies Parkway Drive, Aubell Lane, and the Westlog mill site as possible sites from which to develop trail access into Jedediah Smith Redwoods State Park. The county general plan further identifies the Westlog mill site on Elk Valley Road as a potential visitor destination area. General plan policies indicate that a public access easement from Elk Valley Road to the RNSP boundary should be part of a development permit. The easement would allow development of public parking and a trailhead to connect to a trail into Jedediah Smith Redwoods State Park. The most likely trail connection would be to the Boy Scout Tree Trail. CDPR is considering a trailhead at Aubell Ranch.

Humboldt County

Two plans cover trails in northern Humboldt County. The Humboldt County Recreational Trails Plan was drafted in 1979. The 1990 North Coast Area Plan (NCAP), which is part of the Humboldt County General Plan for management of areas within the Coastal Zone, describes general policies for recreation, access, and resource protection that apply to coastal areas south of RNSP.

The Redwood Community Action Agency (RCAA) revived trail planning in Humboldt County in 1999 with an interest in updating the county trail plan. RCAA, in conjunction with the Humboldt County Planning Department, formed the Humboldt County Trails Coalition to bring together agencies, organizations, and trail users to facilitate and promote development of integrated trail networks between communities and recreational areas. RCAA has obtained funding for planning for trails along the Eureka waterfront and has begun site-specific planning, design, and construction of some trails, notably the Coastal Trail. The Trails Coalition is formulating conceptual plans for several types of multi-use trails, including water trails in county waterways, lagoons, and Humboldt Bay.

The 1979 draft Humboldt County Trails Plan is intended to establish guidelines for establishment of a comprehensive trails program to develop a network of safe and efficient trails for bicyclists, equestrians, and hikers. The plan identifies land ownership, funding, and trail user conflicts as major public concerns to be addressed in trail planning. The plan is oriented toward trails to serve local day-use community needs and relies on public agencies to satisfy demands for longer duration trail activities.

The 1979 county trail plan urged the NPS to designate a Coastal Trail route. It is county policy that the Coastal Trail follow existing public lands and public beaches but move inland to the nearest available public route in situations when there would be substantial conflicts between trail use and private land ownership. The Coastal Trail is in place through most of RNSP. The proposed RNSP trail at Gyon Bluff (trail R) would add another hiking segment to the Coastal Trail.

RCAA is focusing on completing the Coastal Trail and other local trails that would link Eureka, Arcata, McKinleyville, and Trinidad. The multi-use Hammond Trail between McKinleyville and Arcata and Coastal Trail segments south of Trinidad are being planned and developed as easements are acquired and funding becomes available for construction. From Trinidad, the Coastal Trail can be extended northward to Patricks Point State Park and Humboldt Lagoons State Park, which includes Stone Lagoon.

Stone Lagoon, just south of the RNSP boundary, would be linked to RNSP with proposed trail R at Gyon Bluff. This link with the south end of Freshwater Spit would create a trail running along coastal bluffs rather than along Highway 101 shoulders.

The NCAP established county policies to support recreational development in RNSP, the adjacent state parks and commercial recreational development on private lands adjacent to both RNSP and Humboldt Lagoons State Park. Several NCAP policies are relevant to trail development in RNSP. One policy supported development of a trail to the Tall Trees Grove from the area at the south end of Stone Lagoon. Two additional policies recommend development of a trail between Dry Lagoon in Humboldt Lagoons State Park and RNSP in conjunction with the Redwood Trails private commercial recreational development on the east side of Highway 101 at McDonald Creek, opposite in Humboldt Lagoons State Park. One terminus of a proposed trail Stone Lagoon Horse Trail would be very close to the Redwood Trails RV Park (known locally as the Little Red Schoolhouse). The Stone Lagoon Horse Trail would provide equestrians with access to the horse trails on the west side of Redwood Creek in RNSP. Hikers could reach either the Coastal Trail or the inland trails in the Redwood Creek basin, including the Tall Trees Grove. Continuous hiking trail access to the Tall Trees Grove from Stone Lagoon would only be possible at low flows or during the summer when seasonal footbridges are in place across Redwood Creek.

The NCAP discusses several other trails that are now constructed or are being improved as funding becomes available. The county also supports facility improvements such as adequate trailhead parking and signing. Specific trails mentioned in the NCAP are Caruthers Cove, Ossagon, and Butler Creek trails in Prairie Creek Redwoods State Park. Two other trails mentioned in the 1979 county trail plan have been completed. The Lost Man Creek trail is in place. Bicycle trails to provide opportunities for bikes to ride off the highway or on trails are either completed (Davison Trail, Holter Ridge Bike Trail, Ossagon Trail, Berry Glen bike trail) or proposed in this plan (B-Line bike route (L), Coyote Creek Bike Trail (U)).

The county plan describes a conceptual trail extending from the Redwood Creek trail to the eastern park boundary and then to Six Rivers National Forest, generally following the Bald Hills Road. The East Side Trail (M) and the proposed Lyons Ranch Trail (Q), which originates at Bald Hills Road, would complete this concept within RNSP. The county trail plan proposes a 2.9-mile horse, bike, and hiking trail on the top of the Redwood Creek levee in Orick. The NCAP recommends that the levee be used as part of

the Coastal Trail for access to the beach. A levee trail could connect with RNSP trails close to Orick, creating an additional link between the Coastal Trail and inland trails. The Humboldt Bay Water Trail task force of the Humboldt County Trails Coalition has initiated conceptual planning for a water trail around Humboldt Bay. A water trail is similar to a land-based trail, except that trail users travel in boats between points of interest and stops along the trail. The task force is concentrating on identifying and developing public access points, potential campsites, and interpretive materials for Humboldt Bay. The water trail concept could be expanded to a county-wide scale to incorporate existing county facilities at Big Lagoon, state park facilities at Stone Lagoon, and national park facilities at Freshwater Lagoon. The lagoons are smaller than Humboldt Bay and would be expected to support day-trips or limited overnight use where permitted. The bay is large enough to support multiple sites or points of interest over a multi-day trip with several overnight stops. On a regional scale, Lakes Earl and Tolowa in Del Norte County are large enough to develop a longer trail to complement the Humboldt Bay water trail.

Appendix E—Links Between Park and Regional Trails

This section describes proposed trails that would connect existing trails within RNSP to other trails within the parks and to trails outside RNSP. All construction is subject to site-specific planning and compliance under either NEPA or CEQA, as applicable, subject to the requirements of the responsible agency, and would be completed prior to approval for implementation.

Links to Trails Outside RNSP

Coast-to-Crest Trail—Two of the best-known long-distance trails in the western US, the California Coastal Trail (Coastal Trail or CT) and the Pacific Crest National Scenic Trail (Pacific Crest Trail or PCT), can be linked by construction of proposed trail G between the Little Bald Hills, Mill Creek Horse Trail and the Rellim Ridge trail.

Construction of a trail linking the Coastal Trail with the Pacific Crest Trail would create a route circling the entire state of California. Both the Coastal Trail and the Pacific Crest Trail originate in San Diego County. For information on the routes of Coastal Trail and the PCT, see www.californiacoastaltrail.org and www.pcta.org.

The Coastal Trail is proposed as a continuous trail along 1200 miles of California coastline. About half of the trail is completed. Around 44 miles of the Coastal Trail are established in RNSP, including the segments of Coastal Drive and Gold Bluffs Beach Road that are open to motor vehicles.

The PCT lies about eighty miles east of RNSP. The PCT follows the crest of the Sierra Nevada and Cascade mountain ranges for more than 2,600 miles from Mexico to Canada. The California section of the PCT was completed in 1993.

Both the Coastal Trail and the PCT are considered to be continuous in the sense that a trail route is designated, although there may be gaps in the trail or obstacles such as highways or large water bodies to cross. There are also gaps in the Coastal Trail where topography prevents the trail from passing directly along the shoreline or where private land must be crossed or bypassed. Both the Coastal Trail and the PCT require hikers to cross interstate and other highways or use highway bridges to cross bodies of water such as the Klamath River or San Francisco Bay at the Golden Gate. Long-distance hikers plan their trips knowing that these long-distance trails are not perfectly continuous.

Coast-to-Crest Link—Proposed trail G is needed to link the Coastal Trail at Crescent Beach with the Rellim Ridge hiking trail, the Mill Creek Horse Trail, and the Little Bald Hills Trail. The Little Bald Hills Trail in Six Rivers National Forest reaches the South Fork of the Smith River at the Paradise or Rock Creek trailheads. A hiker continuing up the South Fork of the Smith River along South Fork Road reaches the South Kelsey Historical Trail in Six Rivers National Forest and the Kelsey National Recreational Trail in Klamath National Forest. The latter trail intersects the Pacific Crest Trail in the Marble Mountain Wilderness in Siskiyou County.

The USFS will reconstruct four segments of the historic Kelsey Trail along the South Fork of the Smith River in the Smith River National Recreation Area that will allow hikers and equestrians to cross mostly forest lands rather than hiking along South Fork Road (USFS 2007). These segments include the Boulder Creek Trail segment along the South Fork of the Smith from Paradise Flat to Canthook Creek; the Canthook Creek Trail segment along Canthook Creek from its confluence with the South Fork of the Smith River to Hurdygurdy Creek; the Hurdygurdy Creek Trail segment from the Canthook Trail intersection to its intersection with the Big Flat Trail; and the Big Flat Trail from the Hurdygurdy Trail intersection to its terminus near the Big Flat campground. Slightly less than a mile of the Boulder Creek Trail would use the county road. The Hurdygurdy Trail requires major reconstruction as most of the old historical sections have been obliterated. The Big Flat Trail will follow Forest Service Trail Accessibility Guidelines to meet the Architectural Barriers Act. The Canthook Creek Trail requires a low water crossing of the South Fork of the Smith River. An alternative route that would not require a river crossing is also proposed. The Redwood Flat Trail from the Canthook Trail to the intersection with Forest Road 15N58 would allow year-round use of the trail; the Canthook Trail would be used primarily in summer and fall at low river flows.

The South Kelsey Historical Trail begins on the upper South Fork of the Smith River in Six Rivers National Forest about eight miles southeast of the Rock Creek trailhead for the Little Bald Hills Trail. The South Kelsey Historical Trail ends at the Elbow Creek trailhead a few miles west of the Klamath River. Hikers can follow forest roads to State Highway 96 and cross the Klamath River on the Thornton Memorial Bridge near Independence Creek. A few miles of forest roads bring a hiker to the Kelsey National Recreation Trail, which crosses the Pacific Crest Trail at Bear Lake in the Marble Mountain Wilderness.

Links Between the Coastal Trail and Inland Park Trails—Trail links would be established between the Coastal Trail and inland trails in the northern and southern parts of RNSP. These trails would cross U.S. Highway 101 at designated points chosen for visitor safety. The NPS and CDPR would coordinate with Caltrans to designate, develop or construct trail crossings of public highways.

A highway crossing in RNSP is proposed in Del Norte County about 4 miles south of Crescent City near Crescent Beach to link the Coastal Trail to the Pacific Crest Trail. The NPS established a southern crossing in Humboldt County at Berry Glen south of Davison Road about 2 miles north of Orick to link the Davison Bike-Hike Trail to the Lost Man Creek Bike-Hike Trail.

Coastal Trail-Redwood Creek Basin Link—The 2.1-mile-long Berry Glen Trail (trail W) north of Orick would begin directly across Highway 101 from the Davison Hike-Bike Trail and would allow hikers to travel between the coastal and inland trails in the southern part of RNSP. The Berry Glen Trail would be the northwestern end of the East Side Trail. By constructing the Berry Glen Trail, hikers on the west side of Highway 101 would be able to reach the East Side Trail from the Elk Meadow Trailhead or from Prairie Creek Redwoods State Park via the Davison Trail. The Coastal Trail connects to

trails in Prairie Creek state park and can also be reached via Davison Road. Constructing the Skunk Cabbage North trail (trail X) would create a more direct hiking link between Coastal and East Side trails by connecting the existing Skunk Cabbage section of the Coastal Trail to the Berry Glen trail segment of the East Side Trail via the Trillium Falls Trail.

Humboldt Lagoons State Park-Redwood National Park Link—A Stone Lagoon Horse Trail proposed by CDPR would provide equestrian access from near the Stone Lagoon Visitor Center to the WSAR and the proposed A-9 Deck trailhead in the Redwood Creek basin. This trail would provide another connection for hikers between inland trails in Redwood Creek and the Coastal Trail at Humboldt Lagoons State Park.

Other Links between Park Trails and County Trails

Del Norte County Bike Routes—Other possible links between park trails and trails outside the parks include connections between roads and trails in Jedediah Smith Redwoods State Park and bicycle routes in Crescent City and in Del Norte County east of Crescent City. The County has signed Humboldt and Howland Hill Roads as designated bike routes that connect with Enderts Beach Road. Enderts Beach Road provides access to Crescent Beach and to the Last Chance/Nickel Creek segment of the Coastal Trail that is open to bikes. From Howland Hill Road, the bike route would continue on Douglas Park and South Fork Roads.

Between South Fork Road and Gasquet, the county proposal is derived from a US Forest Service proposal to designate a mountain bike trail on six miles of the old route of Highway 199 (“Old Stagecoach Road”) on the southeast side of the Middle Fork of the Smith River. This route would connect two existing routes, one from Crescent City to Hiouchi and the other from Gasquet to O’Brien, Oregon.

Humboldt County-Orick Levees—The 1979 draft Humboldt County Trails Plan proposed that a multi-use trail be constructed on the Orick flood control levees. Establishing this connection through the town of Orick to inland park trails and the Coastal Trail via the Redwood Creek levees requires agreement among private landowners whose land borders the levees, the US Army Corps of Engineers, Humboldt County, and other agencies and individuals. This proposal is outside the scope of this plan and would require site-specific planning and design accompanied by appropriate environmental compliance documents.

Appendix F—Evaluation Criteria for Selecting Trails

Public scoping resulted in a list of 87 proposed trails on national and state park lands in RNSP exclusive of the newly added Mill Creek lands. Since funding and personnel to construct and maintain trails are limited, the NPS and C DPR trails program managers ranked the trails using criteria developed by the Roads and Trails group in the North Coast Redwoods District Office in Eureka.

To select trails from the 87 original proposals, the NPS and C DPR used a numerical ranking system. The ranking system assigned each trail positive or negative points for each of 29 criteria. These criteria are based on the issues raised in public, agency, and park staff scoping sessions, management objectives, and criteria related to safety, resource protection, visitor experience, and construction and maintenance concerns.

All proposed trails were assigned points for each of 29 criteria based on the judgment of the planning team members. Trails were ranked according to the total point score. Appendix C lists the criteria used to rank trails for new construction or removal. Of the 29 criteria, 19 criteria were worth positive points, and 10 criteria counted against a proposal (negative points). The estimated construction cost of a proposed trail based on length of trail, type of surfacing such as paving or boardwalk, ease of access for construction crews, or land ownership was not used as a scoring criterion.

Trails proposed for removal were ranked separately from proposed new trails. No proposals for trail removals were received through the public scoping process. C DPR selected 7 trails for possible removal. These trails are known to cause resource damage, to have extremely high maintenance costs because repair is needed on a regular basis, to have a very low level of visitor use or are redundant in terms of destination or visitor experience. For trail removals, trails with the lowest scores were included in the proposal for removal.

To rank trails, each trail was assigned points for each criteria based on the judgment of the planning team. Scoring criteria and possible score were based on potential effects on resources and visitors, goals and objectives for the trail plan from the 1999 GMP/GP, public scoping input, and construction and maintenance costs.

Criteria that were considered negative factors are in parentheses. Criteria used to evaluate only proposed removals are marked with an asterisk (*). One criterion marked with two asterisks applied to both construction and removal proposals.

Evaluation criteria and possible score

- Is connecting link in a major through trail (Coastal Trail, Pacific Crest). 10 points. *Through trails are major trails on trail systems that span the state of California or connect to other states.*
- Meets accessibility standards. 10 points. *Accessibility standards are those being developed by the Access Board [a Federal agency responsible for developing design standards for accessible facilities].*

- Serves as a connecting link to interagency trails. 9 points. *Interagency trails are trails that span between two or more public land agencies.*
- Trail is located on a stable land base and will provide a sustainable trail. 9 points. *A stable land base is one that does not have land creep, landslides, slumping, soil saturation, or drainage problems. A sustainable trail requires only routine maintenance, not major repairs on a regular basis.*
- Serves as connecting link to intra-agency trails. 8 points. *Intra-agency trails are trails that are located within one public land agency.*
- Is within a major visitor use facility (campground). 8 points. *A major visitor use facility would be a campground.*
- Connects with one or more trails to provide a loop. 8 points. *Loop trails are trails that provide a continuous hiking route that does not require returning along the same route.*
- Connects two major visitor use facilities. 7 points. *A major visitor use facility would be a campground or a visitor center.*
- Trail route provides a loop. 7 points. *Loop trails are trails that provide a continuous hiking route that does not require walking back along the same route.*
- Emanates from a major visitor use area. 5 points. *A major visitor use facility would be a campground or visitor center. Trails emanating from major visitor use areas have a trailhead at visitor center, developed day use areas, campgrounds, etc.*
- Provides a high quality recreational experience (esthetics, unique features, etc.) 5 points. *Trails that provide visitors with a quality recreational experience offer wildlife viewing, historic structures, specimen trees, streamside settings, variety of vegetation types, etc.*
- Corrects visitor safety problem or traditional way trail problem. 4 points. *Visitor safety issues are related to poor trail alignment and construction and way trail problems are related to traditional unimproved access.*
- Provides access to a backcountry visitor facility. 4 points. *Backcountry visitor facilities are trail camps, environmental camps, etc.*
- Has vistas or viewsheds. 4 points. *Vistas and viewsheds offer exceptional scenery such as pristine ocean shorelines, large natural prairies, forest canyons, lagoons, rivers, etc.*
- Emanates from a minor visitor use area. 3 points. *Minor visitor use areas are picnic areas, parking areas with restrooms, etc.*
- Is an interpretive or nature trail. 3 points. *Interpretive and nature trails have exhibits or self guided brochures that interpret natural and cultural features along the trail.*
- Provides access to natural or cultural sites (destination). 3 points. *These trails incorporate or lead people to cultural or natural resource sites that provide an enjoyable experience but do not threaten or adversely affect the resource. Examples may include old homestead sites, barns, specimen trees, salmonid spawning riffles, etc.*
- Has parking facilities at trailhead. 2 points. *These trails have parking at or near the trailhead.*
- Has potential for trailhead parking facilities. 1 point. *Trails have areas that can be developed for parking that is consistent with the GMP/GP.*

Points were subtracted for trails with the following characteristics.

- Trail alignment conflicts with park operations. (–5 points) *Trail alignment interferes with park operations such as trails routed through or near outdoor education facilities, corporation yards, employee residences, etc.*
- Trail construction requires extensive engineering and structure development with high construction and maintenance costs. (–5 points) *Trail construction requires extensive structure development including bridges, retaining walls, etc., with structure complexity, cost, and numbers a factor.*
- Trail construction requires a substantial amount of land disturbance and alteration that changes the character of the land and impacts park resources.(–5 points) *Trail construction requires a substantial amount of land disturbance including tree removal, large cuts and fills, and canopy disturbance resulting in a long-term change in the lands' character.*
- Trail is located in or passes through a wetland. (–5 points) *Trail alignment passes through wetland areas meeting the definition of the U.S. Army Corps of Engineers.*
- Trail is located in or passes through an American Indian cultural site. (–5 points) *Trail alignment passes through American Indian cultural sites including villages, burial sites, ceremonial sites, and shell middens.*
- Trail is located in or passes through a breeding or rearing area. (–5 points) *Trail alignment passes through wildlife breeding or rearing areas including elk calving areas, songbird-nesting areas, peregrine falcon nesting areas, etc.*
- Trail is located in or passes through a unique native plant community. (–5 points) *Trail alignment passes through a unique native plant community such as natural prairies comprised mostly of native grasses, oak woodland forest, etc.*

The following criteria were used to evaluate trails for possible removal.

- *Trail causes damage to the natural or cultural resources of the park. (–5 points) *An existing trail is causing resource damage.*
- *Trail is redundant or parallel route. (–5 points) *An existing trail route provided access to points served by another trail.*
- *Trail receives little visitor use. (–5 points) *An existing trail is rarely used by visitors because other trails serve the area or because there is no attraction for visitors.*
- Trail will require land acquisition or easement. (–5 points) *The proposed trail route is not entirely on parkland and will require land acquisition or an easement to construct.*
- **Trail is a dead end or one-way trail. (–5 points) *Trail alignment does not have a return route or loop and requires traveling back along the same route.*
- Trail is located in critical habitat of an endangered species. (–10 points) *Trail alignment passes through critical habitat of a rare, endangered or threatened species and results in an adverse impact to those species, including marbled murrelet habitat in old-growth redwood forest, western snowy plovers and ocean beaches, and western lilies and coastal bluffs. [Critical habitat is defined here as “important habitat”, not as designated critical habitat under the federal Endangered Species Act.]*

Appendix G—Measures to Minimize Project Effects on Listed Species

Measures to Protect Fish and Designated Critical Habitat

Riparian cover on fish-bearing streams and where non-fish bearing streams lead immediately into fish-bearing waters will be protected wherever reasonably feasible, balancing quality and benefits of the riparian cover against risks of sediment delivery.

Effective erosion control measures shall be in place at all times during restoration activities. Activities within the 5-year floodplain of fish-bearing streams will not begin until all temporary erosion controls (e.g. straw bales, silt fences that are effectively keyed in) are in place, downslope of project activities within the riparian area. Erosion control structures shall be maintained throughout, and possibly after, activities. Erosion control devices such as check dams, silt fences, and other acceptable techniques shall be used when the potential exists to have sediment or other materials entering bodies of water.

- Any disturbed ground must receive appropriate erosion control treatment prior to the beginning of the wet season.
- All non-emergency project work will be completed during the normal operating season (NOS), that is, between June 15 and October 15 of each year. If more than 0.5 inches of rain is forecast during the dry season, project operations will temporarily cease and sites will be winterized. If periods of dry weather are predicted outside of the NOS, additional small work items may be done, if they can be completed within the window of predicted dry weather. Only those repairs needed to reduce risks from active erosion will be undertaken outside of the NOS, in coordination with NMFS.
- Work sites will be winterized at the end of each day when significant rains are forecast that may cause unfinished excavations to erode. Winterization procedures are supervised at all times by RNSP geologists and involve taking measures necessary to minimize erosion on unfinished work surfaces. Winterization includes the following: smoothing unfinished surfaces to allow water to freely drain across them without concentrating or ponding; compacting unfinished surfaces where concentrated runoff may flow with an excavator bucket or similar to minimize surface erosion and the formation of rills; and installation of culverts, silt fences and other erosion control devices where necessary to convey concentrated water across unfinished surfaces, and trap eroded sediment before it leaves the work site. Adequate erosion control supplies (gravel, straw bales, shovels, etc.) shall be kept at all restoration sites to ensure excavated material is kept out of water bodies.
- Equipment, both hand tools and heavy equipment, will be inspected daily to check for leaks. Equipment that may leak lubricants or fuels into drainage will not be used until leaks are repaired. All equipment will be stored, serviced and fueled outside of riparian areas and away from stream crossings. Heavy equipment will be cleaned (e.g., power washed, steam cleaned) prior to use below the ordinary high water mark.

- A spill plan and materials for spill containment will be available to onsite personnel and all personnel shall know how to use them. In the event of a spill, work shall be stopped immediately, clean up shall begin and the appropriate authorities will be notified.
- Petroleum products, chemicals, fresh cement, deleterious materials, or water contaminated by the aforementioned shall not be allowed to enter flowing waters.
- Disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flows, shall be minimized during excavation.
- Streams with significant surface flow capable of sediment transport off-site must be diverted around excavation areas. The diverted flows shall be returned to their natural stream course as soon as restoration is complete and prior to the rainy season. Any turbid wastewater from project activities and de-watering is disposed of off-site in a location that will not drain directly into a stream channel or carry sediment-laden water into a stream channel.

Listed salmonids that would be in the area would be removed prior to and during stream flow diversion and dewatering. Listed salmonids would be relocated to a suitable in-stream location immediately up or down stream of the work area. This would be done by qualified fishery biologists using nets to capture and relocate listed salmonids when practical. When it is necessary to use electroshockers, the NPS would follow with NMFS guidelines. The NPS would apply for take of listed salmonids if capture and relocation are needed during culvert replacement and installation because the current RNSP section 10 permit does not cover the capture and relocation of listed salmonids during these activities.

Measures to Protect Terrestrial Species

The NPS will implement the proposed action using the following measures.

- Design and implementation of a Corvid Management Strategy based on an adaptive management decision system aimed at decreasing corvid predation of marbled murrelets linked to supplemental human food. The strategy will include the following actions:
 - Creation of a RNSP Corvid Management Strategy document.
 - Baseline corvid density and human food availability monitoring for three years at select existing visitor facilities.
 - After three years (end of 2009) of baseline corvid monitoring, an intensive corvid management program will begin including removing picnic tables from five existing visitor facilities, disallowing dispersed camping along approximately four linear miles of lower Redwood Creek gravel bars and greatly increasing visitor education programs about the negative impacts of intentional and unintentional feeding of wildlife on marbled murrelets (and western snowy plovers and other birds) while continuing to monitor corvid densities and human food availability.
 - The aim of the corvid management program will be to decrease corvid

densities and human food availability at sample monitoring sites by 50% by the end of 2011 or 2012. If the target is met, corvid management will continue as described. If the target is not met, additional corvid management techniques will be implemented in consultation with the USFWS during the following years and monitoring will continue.

- Work on trails, trailheads, or backcountry camps located within a quarter mile [reduced to 500 feet in 2007 through consultation with the USFWS] of suitable bald eagle, spotted owl, marbled murrelet or Pacific fisher habitat that will be constructed or maintained during seasonal noise restriction periods (1 January through 31 August, 1 February through 9 July, 24 March through 15 September, 24 March through 15 June, respectively) will be done using hand tools only. Power tool use during seasonal noise restriction periods will be excluded from areas within a quarter mile [500 feet currently] of suitable habitat for these four species unless protocol surveys have cleared the area of any listed or candidate species presence. Any construction activity that requires pounding (i.e. hammering) will be done outside of the seasonal noise restriction period, if generated sounds are determined to be above ambient levels. Any proposed trail routes that pass through known spotted owl nest groves (an area of approximately a 0.25 mile around known nest sites) discovered during protocol surveys and that require tree cutting will be done outside of the extended spotted owl limited operating period (February 1 through September 15) in order to avoid injuring, harming or disturbing recently fledged owlets.
- Only hand tools will be used to maintain developments in or within a quarter mile of suitable habitat during the seasonal noise restriction period of any of these species if not otherwise cleared by surveys. [quarter mile noise restriction buffer decreased to 500 feet in 2007]
- New or rerouted trail routes will not be placed within the visual disturbance range (i.e. at least > 150 feet) of any known historic or active spotted owl activity centers. Areas without up to date (i.e. within two years) spotted owl surveys will be surveyed to protocol to determine spotted owl presence/absence. Any historic spotted owl activity center which is occupied by barred owls will be considered to be a vacant spotted owl activity center and not avoided. In the event a new nest is discovered, the exact visual range will be determined by a park biologist depending on the nest's location and intervening natural visual screens (e.g. dense vegetation, branches).
- The proposed East Side Trail (M) route currently has a section already constructed but not open to the public. The previously constructed section of Trail M passes within a quarter mile of a known spotted owl pair with a perpetually unconfirmed reproductive status. If a pair of spotted owls places a nest within the visual range of this trail section as determined above, then the trail will be closed from February 1 through July 9 and/or moved. Annual monitoring of this activity center using protocol surveys will continue until the activity center becomes inactive.
- No large trees of any species will be removed during trail construction. Most vegetation removed for trail construction will be shrubs and saplings. On foot trails a vegetation clearance zone of 6 feet wide by 8 feet high will be cleared while on horse trails a clearance zone of 8 feet wide by 10 feet high will be utilized. The maximum size of trees to be removed for trail construction will be 18 inches diameter at breast height (dbh) in dense second growth areas where no alternative route exists.

- All new trailheads will have interpretive signs which will describe the potential negative impacts to nesting marbled murrelets and other birds from the intentional and unintentional feeding of corvids (jays, crows and ravens) as well as penalties for feeding wildlife.
- Western snowy plover impact minimization measures will vary depending on the time of year plovers are present within RNSP and the proximity of the plovers to high visitor use and low visitor use areas. New beach use rules, seasonal beach closures, and increased law enforcement patrol regularity have been implemented to minimize impacts to western snowy plovers.

Appendix H—Potential Impacts to Cultural Resources

These tables summarize potential impacts to known cultural resources from proposed trails, trailheads, and backcountry camp areas.

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
Proposed Trails						
A. Hiouchi Flat Trail/ Alts BCD/ Tolowa	Allen and Newland 2002; Griffin 1994a&b, Maneiry and Millet 2008; Roland 1991; Smith 1980a, 1981, 1994a, 1994b, 1994c; Tushingham 2006, Tushingham et al. 2008	CA-DNO-26 (eligible for listing on National Register of Historic Places)	Chvnn-su'lh-dun (eligible)	Jed Smith Camp-ground Historic District (unlikely eligible)	Long term, moderate, direct, adverse impact/ Adverse	Section 106 NHPA compliance required prior to implementation/ Adverse effect to archeological resources possible.
		CA-DNO-332				
		HR-2 (eligible)				
		HR-3 (unlikely eligible)				
		HR-10 (unlikely eligible)				

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
G. Rellim Ridge- Coastal Trail Connector/ Alts BCD/ Tolowa	None	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/
H. Crescent Beach Hiking Loop/ Alts BCD/ Tolowa	None	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation
I. Flint Ridge Loop West/ Alt C/ Yurok	None	Undetermined	Likely	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/
J. Flint Ridge Loop East/ Alt C/ Yurok	None	Undetermined	Likely	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Section 106 Consultation to be with Yurok THPO in lieu of SHPO 36 CFR 800 2(c)(2)

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
K. Coastal Drive Bypass Trail/ Alt C/ Yurok	Sloan 2004, Moratto 1973	DNO-265H (Crivelli Ranch);	Welkew Brush Dance Site	WWII Radar Station B-71	Negligible to minor indirect adverse impacts/ No adverse effect expected	CR inventory and Section 106 NHPA compliance required prior to implementation/ Section 106 Consultation to be with Yurok THPO in lieu of SHPO 36 CFR 800.2(c)(2). A portion of this trail would be on existing coastal drive. Indirect impacts are possible from increased visitation. WWII Radar Station is located on a spur trail off of Coastal Drive. It currently receives lots of visitation. This would not be expected to change as part of the proposed trail.
		CA-DNO-264H (Harris House)				Coastal Trail segments that require new construction would require cultural resources inventory.
		CA-DNO-6				
		DNO-266H (World War II Radar Station B-73)				
		CA-DNO-35				

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
L. B-Line Bike Trail/ Alts BCD/ Yurok	King 1980b, Sloan 2006	CA-HUM- 709H	Undetermined	Undeter- mined	Negligible to minor indirect adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation; Survey from Intersection with B-500 road to CalBarrel Road is needed/ Project located entirely on already existing Road B-200. Small modifications to road would be required. Ground disturbance is expected only within the existing road corridor. No new ground disturbance expected. Site CA- HUM-709H is located off of the road corridor. This section of road is currently used for logging truck access, mountain bikes, and hikers. No adverse impacts would be expected from the official use of this trail segment from mountain bikes.
M. East Side Trail M ^A :Lady Bird Johnson Grove to Dolason Creek (1999 RNSP GMP)/	Smith 1993a	Undetermined	Potentially will pass in the vicinity of a remnant portion of Gann's Prairie	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Only the segment between Dolason Trail and Dolason Creek has been inventoried.

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
Alt A/ Yurok, Chilula						
M ^B :LBJ to Tall Trees Trail to Counts Hill Creek/ Alt B/ Chilula	Smith 1993, Moratto 1971, Bickel 1979, Salzman 1979, Baker 1981	CA-HUM-234	Undetermined	Undeter- mined	Negligible to minor adverse impacts	CR inventory and Section 106 NHPA compliance required prior to implementation/ Existing inventories are outdated.
		CA-HUM-347	Undetermined	Undetermin ed	Negligible to minor adverse impacts	
M ^C :LBJ to Tall Trees Trail to Copper Creek/ Alt C/ Yurok, Chilula	Smith 1993a, Moratto 1971, Bickel 1979, Salzman 1979, Baker 1981	CA-HUM-234	Gann's Prairie	Gann's Prairie	Negligible to minor indirect adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ HUM-234 is approximately 279 meters from the proposed trail segment. The M ^C alternative in these sections is to the west of and on a slightly lower contour elevation than the M ^B or M ^D alternatives.
		CA-HUM-347				Archeological site CA-HUM-347 is approximately 200 meters or more from the proposed trail segment. No impacts would be expected.

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
[M ^C]		CA-HUM-349				Archeological site CA-HUM-349 is approximately 370 meters from proposed trail M ^C and 600 meters from proposed trail M ^B or M ^D . No impacts would be expected.
M ^D :LBJ to Tall Trees Trail to Copper Creek/ Alt D/ Yurok, Chilula	Smith 1993a, Moratto 1971, Bickel 1979, Salzman 1979, Baker 1981	CA-HUM-234	Gann's Prairie	Gann's Prairie	Negligible to minor indirect adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ HUM-234 is approximately 279 meters from the proposed trail segment. The M ^C alternative in these sections is to the west of and on a slightly lower contour elevation than M ^B or M ^D alternatives.
		CA-HUM-347				Archeological site CA-HUM-347 is approximately 200 meters or more from the proposed trail segment.
		CA-HUM-349				Archeological site CA-HUM-349 is approximately 370 meters from proposed trail M ^C and 600 meters from proposed trail M ^B or M ^D .

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
O. Redwood Creek Beach Nature Trail/ Alts BCD/ Yurok	Moratto 1971, 1972, 1973; Reuter 1982; Fitzgerald 1992.	CA-HUM-132	Sigwets	Undetermined	Negligible to moderate direct adverse impacts/ Potential adverse effects	CR inventory and Section 106 NHPA compliance required prior to implementation/ Since CA-HUM-132 has never been relocated, but is firmly cited by Yurok descendents as being in this vicinity, additional consultation and research would be needed. Reburied human remains in the vicinity require protection.
P. Whiskey 40 Interpretive Trail/ Alts BC/ Yurok	No prior inventory	None	Gann's Prairie	Gann's Prairie	Negligible to minor indirect adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Archeological resources known in vicinity of Gann's Prairie; however, these are well outside the APE of the proposed trail.
Q1. Lyons Ranch Loop:East Side Trail to Lyons Ranch Trailhead on Bald Hills Road/ Alt C/ Chilula	Bickel 1979; Salzman and Bickel 1979; Svinarich 2002a, 2002b	CA-HUM-448	Yes	Lyons Ranch Historic District	Negligible to moderate direct adverse impacts/ Potential adverse effects	CR inventory and Section 106 NHPA compliance required prior to implementation/ CA-HUM-448 could be affected if trail route connects to Bald Hills Road within the site boundary. Avoidance may be possible.

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
[Q1]		REDW-2005-06				REDW-2005-06 is the Lyons Ranch Road which is a contributing element to the National Register District. Treatment of this road will need to be within the Secretary of Interior guidelines. No adverse impact is expected, since no change to the road corridor is proposed.
Q2. Lyons Ranch Loop:East Side Trail to Lyons Ranch Homeplace/Alts BC/Chilula	Bickel 1979; Salzman and Bickel 1979; Reuter 1980,Smith 1990, and Svinarich 2002a, 2002 b	REDW-2005-06	Yes	Lyons Ranch Historic District	Negligible to minor indirect adverse impacts	CR inventory and Section 106 NHPA compliance required prior to implementation/ Trail will not be constructed through these recorded resources. However it will connect to existing roads and trails. Indirect adverse impacts could occur from increased access and use.
		CA-HUM-481H				Indirect effects possible from increased visitation.
		CA-HUM-440				Indirect effects possible from increased visitation

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
R. Gyon Bluff Segment - Coastal Trail/ Alts BC/ Yurok	Moratto 1971, 1972, 1973; Smith 1990b.	None known	Yes	Undeter- mined	Long term, direct and indirect moderate adverse impact/ Adverse effect to Tradition- al Cultural Property potentially eligible for listing on NRHP	CR inventory and Section 106 NHPA compliance required prior to implementation/ "The point of land jutting out into the ocean at the south end of the spit should be managed protected for its sacred values". Comments received from Yurok Tribe on Freshwater DCP. Comments also received from trail plan...."Proposed location of trail is also proposed in the vicinity of historic trail that was used traditionally by Native Americans traveling between Orick and Trinidad".
S. Tom McDonald Creek Loop/ Alt C/ Chilula	Smith 1998a	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
T. Bridge Creek Trails/ Alt C/ Chilula	Baker 1981; Bell 1980a, 1980b; Smith 1980 c, Baker and Salzman 1982; Smith 1987, 1989, 1990c	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation
U. Coyote Creek Bike Trail/ Alts BCD/ Chilula	Fitzgerald and Smith 1991, Smith 1993b, Svinarich 2005	CA-HUM-625	Yes	Lyons Ranch Rural Historic District: Rock Fork Road, Ranch Road, Coyote Creek Cabin and outbuilding, Long Ridge Sheep Shed and fence lines are contributing elements to the historic district	Long term, direct, moderate adverse impact/ Adverse Effect to CA- HUM- 625 requiring mitigation	CR inventory and Section 106 NHPA compliance required prior to implementation
		CA-HUM- 961H				Indirect impacts and effects to this historic cabin could occur from increased visitation.
		CA-HUM- 963H				Indirect impacts and effects to this historic barn could occur from increased visitation.
		REDW-2003- 02 (fence lines)				No impacts or adverse effects to fence line features expected.

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
V. Skunk Cabbage Ridge/ Alts AC/ Yurok	Salzman and Bickel 1979, Smith 1998b	None known	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effect if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation
W. Berry Glenn Trail/ Alts ABCD/ Yurok	No prior inventory	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effect if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation
X. Skunk Cabbage North Trail/ Alts ABCD/ Yurok	Salzman and Bickel 1979, Smith 1998b	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effect if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation.
Y. Davison Ranch Equestrian Loop/ Alts AC/ Yurok	Moratto 1973, Salzman and Bickel 1979	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effect if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
Proposed Trailheads						
Wilson Creek Trailhead/ Alts BCD/ Yurok, Tolowa	Griffin 1994a, 1994D (076-90)	None	None	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation
Whiskey 40 Trailhead/ Alts BC/ Yurok	No prior inventory	Undetermined	Undetermined	Undeter- mined/ Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	
Coyote Peak Road Trailhead/ Alt C/ Yurok, Chilula	Smith 1993b, Fitzgerald and Smith 1991	CA-HUM-625	Yes	Lyons Ranches Rural Historic District/ Rock Fork Road is contributing element to the Lyons Ranches Rural Historic District	Long Term, direct, moderate adverse impact/ Adverse to CA- HUM-625	CR inventory and Section 106 NHPA compliance required prior to implementation
A-9 Deck Horse Trailhead/ Alts BCD/ Yurok	Baker and Salzman 1982, Svinarich 2007	None	Undetermined	None/None	Negligible to minor adverse impacts/ Possible adverse effects if historic properties	CR inventory and Section 106 NHPA compliance required prior to implementation

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
					found during inventory	
N of B-5-2 Road (trailhead)/ Alt C/ Yurok	Baker and Salzman 1982	None	Undetermined	None/None	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	Trailhead would be located where Bridge Creek Trails connect to WSA north of Rogers Peak and north of the B-5-2 intersection.
West Side Access Road near Rodgers Peak (trailhead)/ Alt C/ Chilula	Baker 1981, Salzman and Bickel 1979	None	Undetermined	None/None	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	Trailhead would be located where Bridge Creek Trails connect to West Side Access Road at the southwest side of Rodgers Peak.
Mill Creek Horse Trail trailhead/ Alts BCD/ Tolowa	Griffin 1994c	None	Undetermined	None/None	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	Trailhead already exists. Proposal would be improvements to existing trailhead.

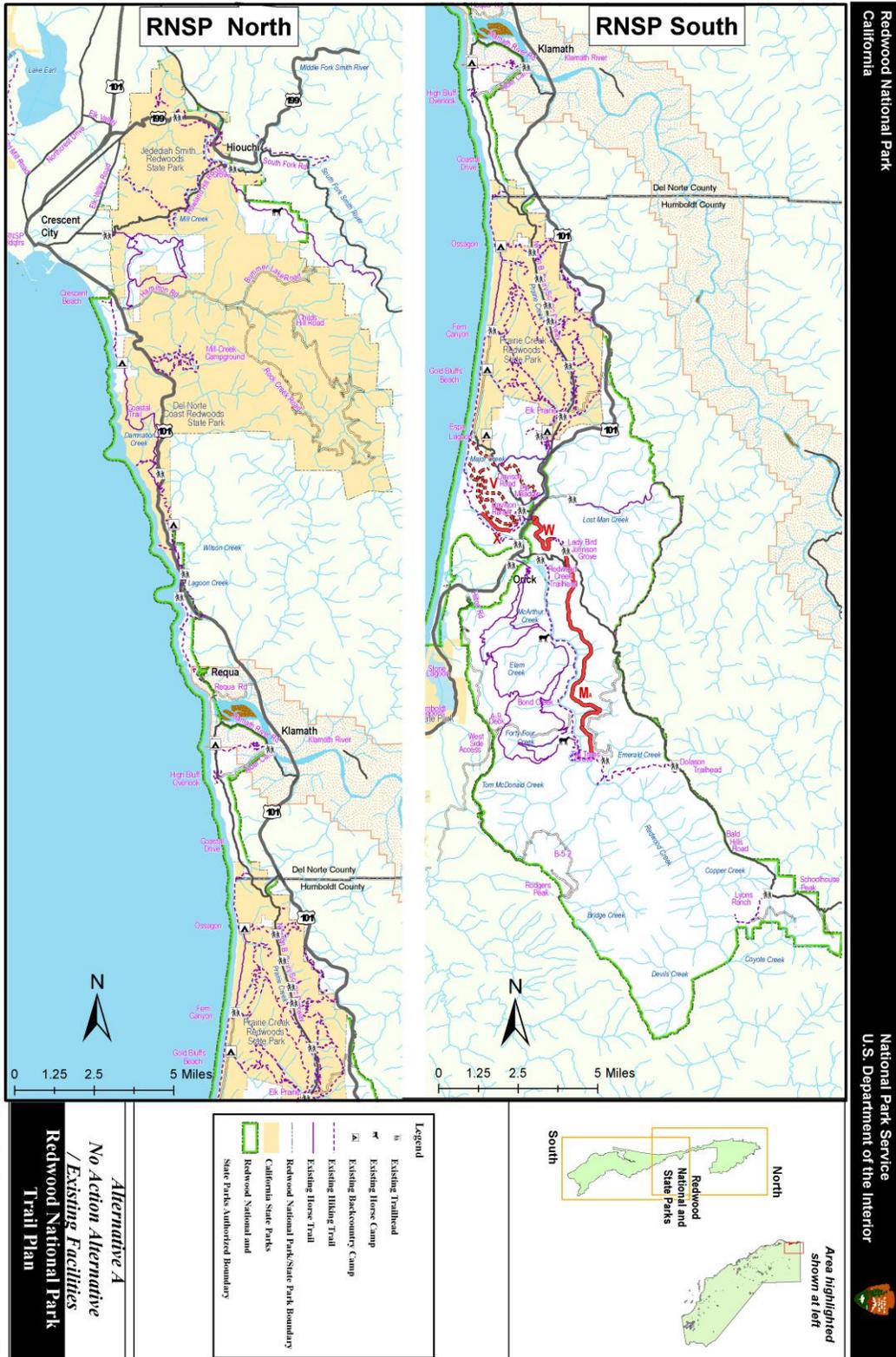
Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
Lyons Ranch trailhead/ Alts BCD/ Chilula	Bickel 1979; Salzman and Bickel 1979; Svinarich 2002a, 2002b	REDW-2005-06/ CA-HUM-448	Yes	Lyons Ranches Rural Historic District/ Lyons Ranch Road is a contributing element to the Lyons Ranch Rural Historic District	Negligible to minor adverse impacts/ No adverse effect expected	CR inventory and Section 106 NHPA compliance required prior to implementation/ Trailhead design and construction would be consistent with Secretary of Interior Standards for Historic Preservation/ Lyons Ranch Road is not likely to be adversely impacted or affected by proposed use. Existing current management practices would continue that are consistent with the Secretary of Interior Standards for Historic Preservation/ Moving trailhead off the ridgeline could be beneficial to CA-HUM-448
Backcountry Camps and Camping Areas						
Skunk Cabbage Creek/ Alts BCD/ Yurok	1983	Undetermined	Undetermined	Undetermined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Inventory is outdated; new inventory would be needed.

Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
Miller Creek/ Alts BC/ Chilula	Baker and Salzman 1982	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Inventory is outdated; new inventory would be needed.
Counts Hill/ Alts BC/ Chilula	Moratto 1971, Salzman 1979, Baker 1981	Undetermined	Undetermined	Lyons Ranches Rural Historic District	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Inventory is outdated; new inventory would be needed.
Copper Creek/ Alts BCD/ Chilula	Bickel 1979, Salzman and Bickel 1979	Undetermined	Undetermined	Lyons Ranches Rural Historic District	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Inventory is outdated; new inventory would be needed.
Coyote Creek Bike- Hike/ Alt C/ Chilula	Fitzgerald and Smith 1991	Undetermined	Undetermined	Lyons Ranches Rural Historic District	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Inventory is outdated; new inventory would be needed.

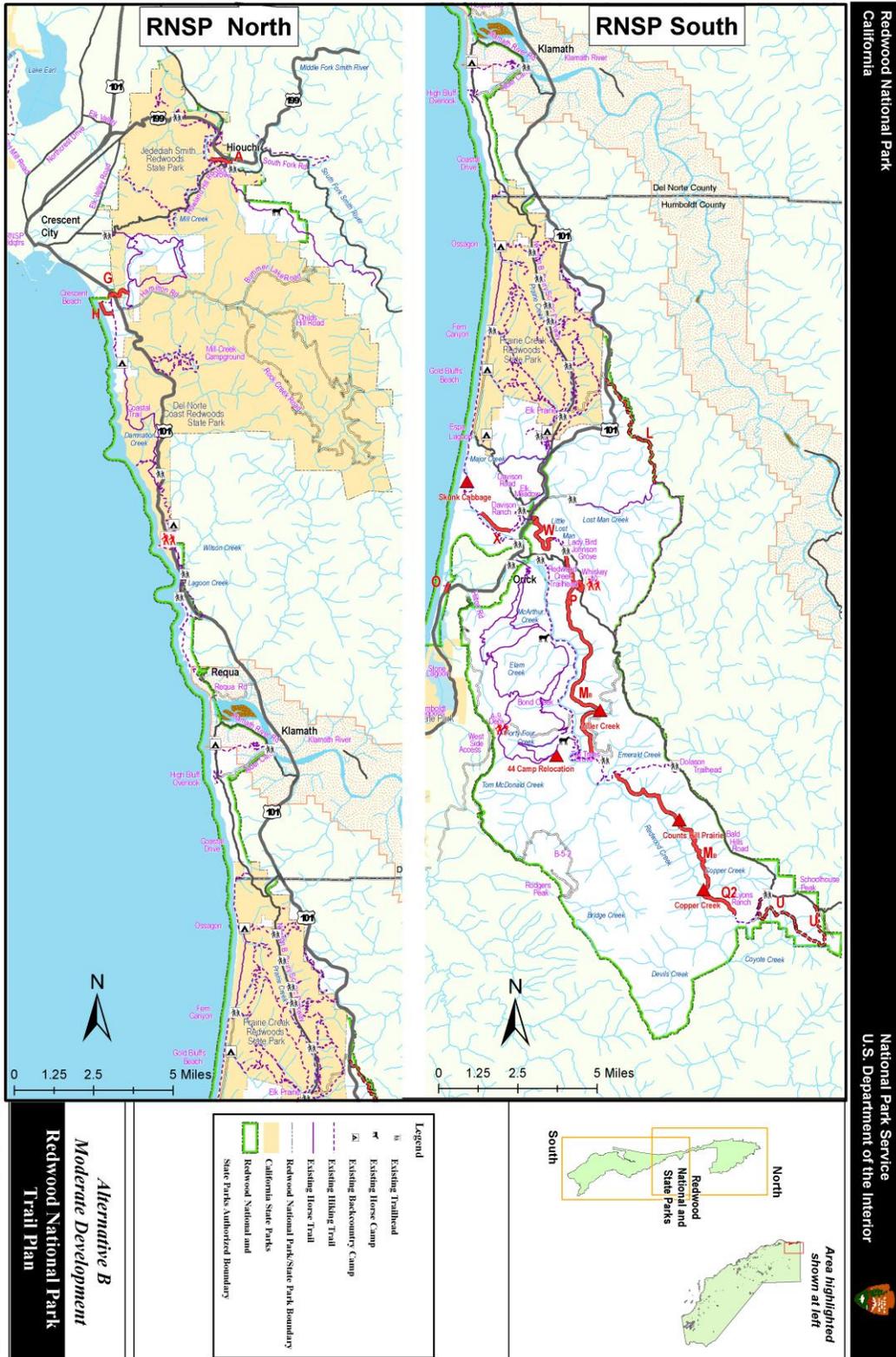
Trail ID/ Name/ Alternative /Ancestral Lands	Previous Cultural Resource Inventory	Archeological Resources	Resources of Ethnographic Significance	Cultural Landscapes /Historic Structures	Possible Impacts NEPA/ Possible Effects NHPA	Recommendation/ Comments
Fortyfour Creek horse camp/ Alts BCD/ Chilula	Smith 1980c	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation/ Proposed camp would be located somewhere along the G-6-1 Road
West Side dispersed/ Alt C/ Chilula	No prior inventory	Undetermined	Undetermined	Undeter- mined	Negligible to minor adverse impacts/ Possible adverse effects if historic properties found during inventory	CR inventory and Section 106 NHPA compliance required prior to implementation
Redwood Creek gravel bars/ Alts ABCD/ Chilula	No prior inventory	None	Undetermined	None	No impacts/ No effects	

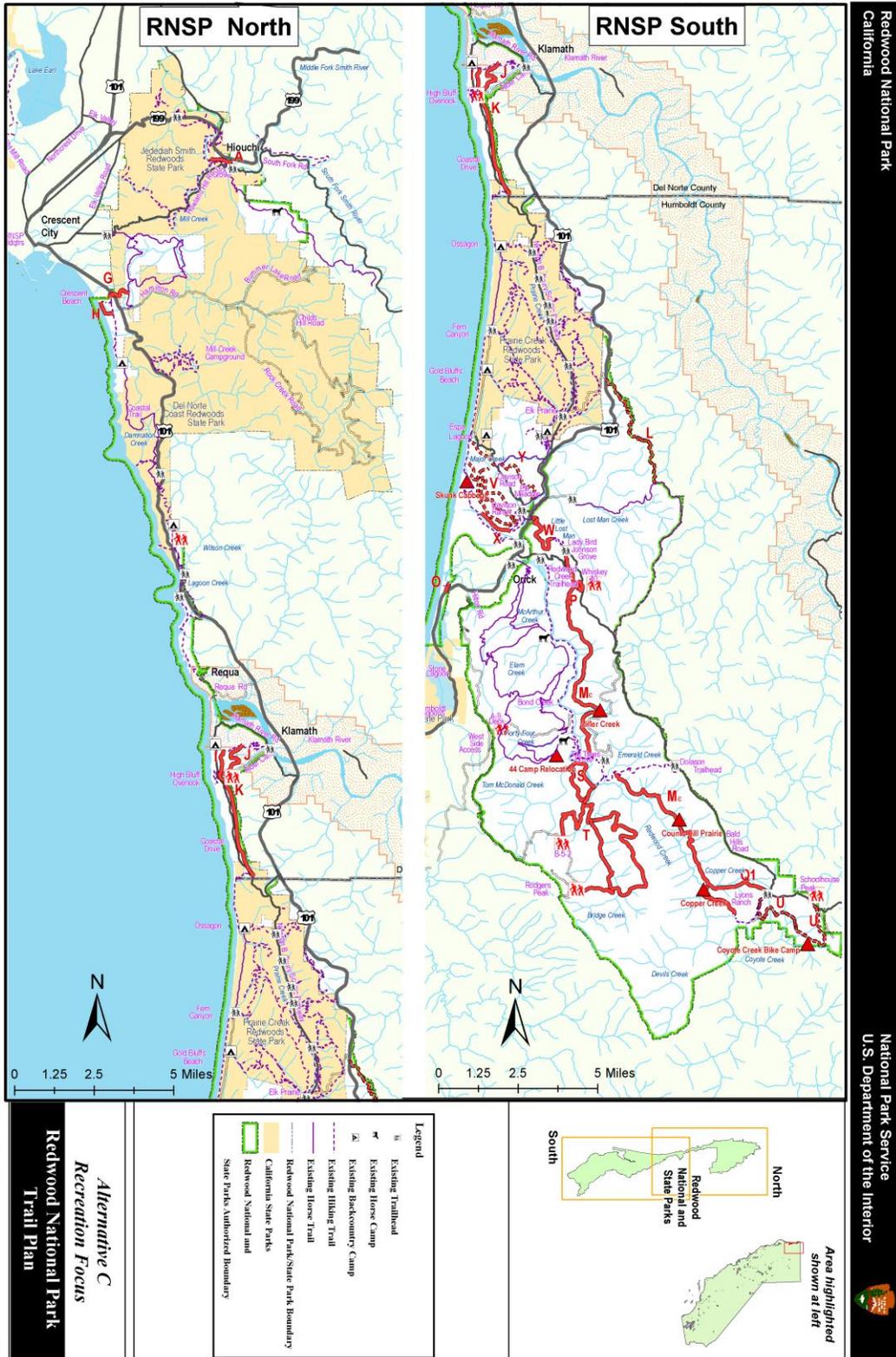
Appendix I–Maps of Alternatives

Proposed trails, trailheads, and backcountry camps in the national park are shown on a map for each of the four alternatives, along with existing trails and associated visitor facilities throughout Redwood National and State Parks.



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