Finding of No Significant Impact
Second Growth Forest Restoration
South Fork Lost Man Creek
Redwood National Park
Humboldt County, California
March 2009

Introduction

This Finding of No Significant Impact (FONSI) should be attached to the *South Fork Lost Man Creek Second Growth Forest Restoration Environmental Assessment* (EA) dated December 2008. This FONSI together with the EA constitute a full and complete record of the conservation planning and environmental impact analysis process for this proposal.

The EA is tiered off the Redwood National and State Parks 1999 *Final General Management Plan/General Plan, Environmental Impact Statement / Environmental Impact Report* (GMP/EIS). The GMP directed that forest restoration activities in the parks should emphasize use of silvicultural methods in second growth forests to re-attain old growth characteristics in the shortest time possible.

Purpose and Need for Second Growth Forest Restoration

Redwood National Park was established by Congress in 1968 to "preserve significant examples of the coastal redwood ... forests and the streams and seashores with which they are associated for purposes of public inspiration, enjoyment, and scientific study." (Public Law 90-545).

In 1978, Congress expanded the national park to encompass 50,000 acres in the lower one-third of the Redwood Creek watershed, much of which had been privately owned timber lands. The 1978 expansion area included approximately 38,000 acres that had been logged between 1950 and 1978. The common logging practice in the region at that time was clearcut tractor logging in which almost all old growth trees and associated vegetation were cleared off a site and the logs dragged out using tractors. Harvested areas were replanted, the trees allowed to grow to a certain size, and then thinned to promote growth of remaining trees before the next cutting.

With the creation of Redwood National Park in 1968 and expansion in 1978, commercial timber operations including active forest management and silvicultural thinning ceased. The NPS has not actively managed logged forests in what is now the park, which has resulted in second growth forest conditions considered unhealthy from both a silvicultural and an ecological standpoint. The second growth forests in the park retain the legacy of the regeneration methods used to initiate a new commercial forest stand without the subsequent silvicultural thinning needed to reduce the densities and release the remaining trees. Many of the second growth forest stands that remain are primarily high density, even-age Douglas-fir stands, with little canopy structure and no understory development.

All of the South Fork of the Lost Man Creek watershed in the lower Redwood Creek basin was intensively logged from the 1950s to the 1970s. Portions of the area were clear-cut logged in 1954 and 1962. The second growth forests in the South Fork of Lost Man Creek are in a highly impaired condition compared to the original old growth redwood forests. The impaired condition is evident from the excessive tree density, lack of understory vegetation, and the overabundance of Douglas-fir in relation to redwood. Failure to thin logged and reseeded forests has delayed the

development of structure, complexity, and wildlife habitat that exist in unlogged mature forests. Without silvicultural treatments to create openings in the canopy, these second growth stands are expected to persist in an impaired condition for many decades or even centuries before they recover ecological and structural characteristics resembling those found in old growth forests.

The purpose of restoration of second growth forest stands in the South Fork of Lost Man Creek watershed is to reduce stand density and alter species composition to promote growth of remaining trees and understory vegetation, encourage development of multi-storied canopy, and increase the ratio of redwood to Douglas-fir. Silvicultural thinning is needed to accelerate restoration of forest characteristics that are more typical of old growth redwood and late seral forests in less time than would occur under natural disturbance regimes.

Selected Action and Alternatives

The EA identified and analyzed a no action alternative (Alternative 1) and two action alternatives, Alternative 2: Moderate Intensity Thinning with Biomass Removal for Fuels Reduction (the selected action and the environmentally preferred alternative), and Alternative 3: Low Intensity Thinning from Above.

The approved action to be implemented is the same as that described and analyzed in the EA as the proposed action (Alternative 2: Moderate Intensity Thinning with Biomass Removal for Fuels Reduction). There are no changes in the approved action, mitigations, or other key elements as a result of public comment.

Under the approved action, the NPS will apply five different thinning prescriptions throughout 1710 acres in the South Fork of Lost Man Creek depending on slope steepness, available road access, presence of streams and wetlands, tanoak density, and proximity to old growth forest.

The approved action calls for a basal area reduction of 40% from below on slopes up to 30% where existing roads are available for removal of cut trees. Merchantable wood (trees large enough to sell to a mill for use as lumber or other products) on 361 acres will be removed to reduce the fuel loading and sold to offset the cost of conducting the project. Over five years, an estimated 5.7 million board-feet will be removed, 85% of which will be trees 8-20 inches diameter at breast height (dbh) and the other 15% trees in the 4.5-8 inch dbh size class typically used for pulp or biofuels.

On the remaining 1370 acres, different silvicultural prescriptions will be used. On 503 acres where the slope is greater than 30%, the prescription calls for a 25% basal area reduction from above, with felled trees to be lopped, scattered about the site, and left to decompose. Specific prescriptions will be applied in sites within 300 feet of old growth forest (104 acres total), in stands dominated by tanoak (142 acres total), and in streamside and wetland buffers (622 acres total).

Under the No Action alternative (Alternative 1), second growth forests in the South Fork of Lost Man Creek watershed would not be treated or manipulated with silvicultural techniques to reduce stand density or alter species composition. Existing stand conditions and stand development processes would be allowed to progress under natural disturbance regimes.

Under Alternative 3: Low Intensity Thinning from Above, 864 acres would be thinned with a 25% basal area reduction from above, where dominant or codominant trees are selected for cutting to benefit adjacent trees of the same crown class. Trees cut under this alternative would be left on the ground to decompose. The same silvicultural prescriptions to be used under the approved action would be used in the same parts of the project area with wetlands and stream buffers (622 acres), within 300 feet of old growth forest (104 acres), and in areas dominated by tanoak (142 acres).

Environmentally Preferred Alternative

The environmentally preferred alternative is the action that best promotes the environmental policies outlined in the National Environmental Policy Act (NEPA). 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.

The NPS has determined that Alternative 2: Moderate Intensity Thinning with Biomass Removal for Fuels Reduction (the approved action) is the environmentally preferred alternative. This alternative will accelerate the development of late-seral forest characteristics more quickly than the low intensity thin alternative and will reduce fuels remaining following treatment.

The approved action (Alternative 2) using a moderate intensity thin on 361 acres and a low intensity thin on 504 acres differs from low intensity thinning on 864 acres (Alternative 3) because the approved action will

- Create larger canopy gaps to reduce crown fire potential and to allow for canopy differentiation; the low intensity thin would create smaller canopy gaps.
- Accelerate stand development, release of individual trees, habitat diversity, and reduce edge impacts more quickly than the low intensity thin alternative.
- Minimize the fuel hazard on the moderately thinned area compared to the low intensity thin alternative.
- Restore species composition and Douglas-fir/redwood ratio to more closely resemble old growth forests, where the low intensity thin alternative would still favor Douglas-fir as the dominant species.
- Maximize redwood survival and vigor.

The no action alternative (Alternative 1) is not the environmentally preferred alternative because

- forest stands would continue to be overstocked with predominantly Douglas-fir trees;
- forest understory would continue to be sparse or absent in the presence of dense canopy cover;
- forest stands would continue to provide poor quality wildlife habitat; and
- fire hazard would remain high, with conditions suitable for wildfire that could spread outside the second growth.

Alternative 3 (low intensity thin from above) is not the environmentally preferred alternative because a 25% basal area reduction would not produce late-seral conditions nor restore species composition to pre-disturbance levels as quickly as the approved action. Douglas-fir would continue to be the dominant species using the low intensity thin from above prescription, resulting in species composition that differs from the original community type.

Public Involvement and Agency Coordination
The NPS sent letters to 146 agencies, organizations, and individuals in June 2005, soliciting comments on the proposal to restore second growth forests in the South Fork of the Lost Man Creek watershed. Letters were sent to Hoopa Valley Tribe, Yurok Valley Tribe, Trinidad Rancheria, Resighini Rancheria, Big Lagoon Rancheria, Elk Valley Rancheria, Tolowa Nation, and the Smith River Rancheria. Two tribal meetings were held on April 13 and June 14, 2005 in Orick. One agency scoping meeting was held on June 8, 2005 in Arcata. Three public meetings were held in Arcata, Orick, and Crescent City on June 28, 29, and 30, 2005 respectively. The NPS met regularly with the USFWS and NOAA Fisheries (also known as National Marine Fisheries Service [NMFS]) to incorporate threatened and endangered species protection measures as the project was developed.

The EA was made available for public review and comment on December 19, 2008 for a 57-day review period ending February 13, 2009. Thirty-nine copies of the EA were distributed via U.S. Mail to elected officials; federal, state and local agencies; federally recognized American Indian tribes; organizations; local businesses; and individuals. Copies of the document were available at four local libraries in Crescent City, Arcata, and Eureka, and at park offices in Crescent City and Orick. An additional 45 letters were mailed announcing that the document was available for review on the internet, at libraries, and park offices.

The NPS issued a press release to the standard RNSP mailing list of print, television, and radio media on December 19, 2008 announcing the availability of the EA for public comment. Copies of the EA were provided to the local newspapers in Eureka, Arcata, McKinleyville (all serving Humboldt County where the project will take place), and Crescent City (Del Norte County where park headquarters is located.) The Eureka *Times-Standard*, the Arcata *Eye* and the *McKinleyville Press* published short outlines of the proposal and provided information on how to comment.

The NPS received four letters and one electronic mail message commenting on the project. There were no substantive comments that raised new issues or concerns or required changes to the approved action or to the EA. Four comments expressed full support for the proposed action. One of these letters included detailed comments that are not relevant to a choice among alternatives for management of second growth forests. One comment suggested that watershed restoration should be conducted in conjunction with management of second growth forests. Watershed restoration is being conducted through the park's long-standing watershed restoration program but is beyond the scope of forest restoration as described in the EA.

Endangered Species Consultations
Informal consultation on this project began during a scoping session with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in Arcata, California in June 8, 2005. The project was presented to these agencies in more detail on February 15, 2006. Based on discussions of potential impacts of the selected action to listed terrestrial and aquatic species, formal consultation was conducted with USFWS but not with NMFS.

The NPS submitted a final biological assessment (BA) to the USFWS on August 2, 2007 that described potential effects of the project on northern spotted owls and marbled murrelets, and measures to minimize adverse effects on these two species. The USFWS issued a Biological Opinion (BO) file number 8-14-2004-2133 81331-2008-F-0027, dated December 18, 2007, that

concurred with the NPS determination that the project may affect but is not likely to adversely affect the northern spotted owl and that the project is likely to adversely affect marbled murrelets.

The USFWS concluded that implementation of the proposed action will not affect designated critical habitat for marbled murrelets and is not likely to jeopardize the continued existence of the marbled murrelet. The NPS requested, and the USFWS authorized, incidental take of marbled murrelets on 237 acres from harassment associated with operation of heavy equipment during one breeding season (March 24 through September 15), and on an additional 30 acres during three breeding seasons. During the breeding season, equipment operation will be restricted to a daily limited operating period (LOP) between two hours after sunrise and two hours before sunset.

The NPS determined that this project will not affect listed fish, and therefore consultation with NMFS under section 7 of the Endangered Species Act would not be required. However, the NPS prepared a biological assessment that described potential effects of the project on Southern Oregon/Northern California Coast (SONCC) coho salmon, California Coastal (CC) Chinook salmon, and Northern California (NC) steelhead trout, and measures to avoid or minimize adverse effects on these species and designated critical habitat for these species. The NPS submitted the "no effect" BA to NMFS on October 3, 2007. Because a "no effect" determination does not require a BO, NMFS did not prepare a concurrence response.

Cultural Resource Consultations

The NPS notified the SHPO in November 2004 that an environmental assessment was being prepared and outlined the project. In March 2006, the NPS sent a subsequent letter to the SHPO seeking concurrence with the preliminary findings and recommendations for protecting historic properties in the project area, including two properties on Holter Ridge. The SHPO responded in April 2006 with concurrence that a finding of No Adverse Effect with conditions outlined in the NPS recommendations was appropriate for this project.

The NPS consulted with affected American Indian groups about this project. Ethnographic interviews conducted in 2000 provided information about the project area being used for resource procurement and fishing along the lower reaches of Lost Man Creek. The NPS initiated government-to-government consultations on the plan in June 2005 with the Big Lagoon Rancheria, Elk Valley Rancheria, Hoopa Valley Tribe, Resighini Rancheria, Smith River Rancheria, Tolowa Nation, Trinidad Rancheria, and the Yurok Tribe via a letter informing each group of the proposed project and requesting information about cultural resources that might be affected by the proposal. No comments from any of these groups were received on the proposal.

Consultations with the Yurok Tribe Culture Committee took place on August 26, 2005 and November 18, 2005 at the Klamath tribal office. The initial consultation with the Yurok Tribe Culture Committee resulted in the recommendation to speak in detail with a Yurok elder who has knowledge of the history of trails and logging history of the area and a traditional Yurok basket maker with resource knowledge of the area, particularly a bear grass area close to the coast used by Yurok basket makers.

A post-survey consultation on the survey findings was conducted with the Yurok Tribe Culture Committee on November 18, 2005. The location of the bear grass site on Holter Ridge Road was shared with the committee and recommendations were sought for future management. The Yurok Tribe Culture Committee recommended that the bear grass site be protected and managed to enhance and improve the health of this site.

Why This Project Will Not Have a Significant Effect on the Environment
This section summarizes effects on resources in the context of the project area and the parks as a whole, and documents that none of these effects is significant, highly controversial or uncertain, nor will the selected action adversely affect public health and safety. Further, the selected action is not part of a larger action and will not establish a precedent for future actions.

The EA contains descriptions of the mitigation measures to protect marbled murrelets; detailed descriptions are contained in the USFWS Biological Opinion file number 8-14-2004-2133 81331-2008-F-0027, dated December 18, 2007.

Potential effects to other resources have been determined to be negligible or minor and will not require mitigation on the part of the NPS to avoid or reduce the effects discussed below.

Air Quality—Adverse effects on air quality from the selected action and the low intensity thin alternative will be localized, temporary, minor along roads during the work periods from vehicle emissions and dust, and negligible outside the project area and over the long-term. Air quality will quickly return to very good to excellent when equipment work is completed. The no action alternative would not affect air quality.

Cumulative Effects on Air Quality—Air quality in the parks and the region will continue to be very good to excellent over the long-term. The only potentially significant source of air pollution is from wildfires, which could have significant adverse effects on air quality in the park for the duration of a fire depending on meteorological conditions. Potential adverse effects on air quality from planned fire ignitions are negligible to moderate. The North Coast Air Quality Management District coordinates planned ignitions in Humboldt, Del Norte, and Trinity Counties to minimize cumulative adverse smoke effects on sensitive areas (local communities and highways). The cumulative effect on air quality in the parks from prescribed fires conducted on adjacent private timber lands to reduce logging slash will be short-term, adverse, localized and could range from negligible to moderate depending on wind conditions and how close the prescribed fires are to park boundaries.

Effects on Soils and Topography—All soils affected by the project are previously disturbed from original road construction and logging. Under the selected action, soils will be disturbed again on 361 acres where logs are skidded and from reoccupying 40 landings and about 26 miles of skid trails. There will be no effect on topography and negligible effects on soils because disturbance will be minimized by using existing roads, skid trails, and landings. Effects on soils and topography under the low intensity thin alternative would be the same as under the selected action in areas that are thinned, with lesser effects because fewer trees would be cut on 361 acres and trees would not be removed under the low intensity thin alternative. Soils throughout project area will be protected by prohibiting cutting or heavy equipment use in areas with unstable or potentially unstable soils and by mulching with the cut trees and branchwood following treatment. Because soils were previously disturbed by logging and road construction and because best management practices and rehabilitation measures will be implemented, the effect of the selected action on soils will be minor in the short-term and negligible over the long-term. The low intensity thin alternative would have minor short adverse effects and negligible long term effects. There would be no project-related effects on soils or topography under the no action alternative.

Cumulative Effects on Soils and Topography—The original timber management practices (clear-cut tractor logging, road building, and minimal road maintenance) had significant direct adverse effects on soils from initial disturbance and subsequent erosion. Road and landing construction directly altered topography. After logging ceased, significant adverse effects on soils and topography continued from erosion of disturbed soils and road-related slope failures in portions of the project area.

Cumulative effects on soils and topography in other areas of the park from tractor logging, road construction, and road-related erosion have been widespread, long-term, and adverse. These adverse effects are significant and were major factors leading to expansion of the national park in 1978. The watershed restoration program in the national park is reducing the adverse effects on soils and topography by removing unstable roads and restoring topography to resemble original conditions. Soils damaged by clearcut logging and tractor yarding are recovering as vegetation regrows, stabilizing disturbed areas and enhancing soil formation processes.

Effects on Water Quality, Floodplains, and Wetlands—Under the selected action, there will be no direct effects on floodplains because the project area is located in the upper reaches of the watershed where high-gradient narrow stream channels inhibit the development of floodplains. Direct adverse effects on water quality and riparian wetlands will be avoided under the selected action by establishing streamside protection zones in which no cutting will be permitted, by prohibiting heavy equipment from operating in swales or channel features or on steep slopes, and by varying the thinning prescription in areas where streams or wetlands might be affected. Indirect adverse effects on water quality will be avoided by using thinning prescriptions that protect slopes from erosion and by prohibiting work during wet periods if work would increase the potential for soil erosion and slope failure. Best management practices to protect water quality will be implemented. The short-term adverse effects on water quality and riparian wetlands under the selected action will be negligible. The effects of the low intensity thin alternative are the same as under the selected action. Long-term adverse effects on water quality and riparian wetlands in the project area are described under cumulative effects. Under the no action alternative, water quality, floodplains, or wetlands would not be affected by project-related work.

Cumulative Effects on Water Resources including Water Quality, Floodplains, and Wetlands—The cumulative adverse effects on water quality, floodplains and wetlands in and around the project area, including Lost Man Creek, Prairie Creek, and Redwood Creek, are related to past logging and road building practices that are no longer allowed under current state law and regulations because of the damage caused to watersheds.

Water quality in park streams was impaired by sedimentation from road-related erosion from past timber harvest practices prior to park establishment and expansion. Because the project area watershed is now protected in the national park, future actions that might affect water quality are related to park resource management projects, especially watershed restoration projects that mitigate effects of past land use practices. The impairment to water quality is being reduced as watersheds recover and through watershed restoration projects to remove roads. The long term effect of second growth forest restoration on water quality will be a minor indirect benefit as forests re-attain original structure and function as integral parts of a watershed.

Riparian wetlands in the South Fork Lost Man Creek project area, along Redwood Creek, and in some of the more heavily logged tributaries of Redwood Creek have been destroyed or degraded

by the original logging and road construction, and the effects of road failures and road-related slope failures. Riparian zones along the main stem of Lost Man Creek were not destroyed because the lower portion of the watershed was not logged, so the riparian zone in the lower reaches of the creek retained most of its original functions and values. The long-term effect on riparian wetlands in the project area from management of second growth forests will be a minor indirect benefit, but the greatest benefit to riparian wetlands relies on the effectiveness of watershed restoration at preventing erosion that would lead to landslides that could bury riparian areas and vegetation with sediment.

Effects on Vegetation—The selected action will reduce overall stand densities, stimulate stand growth and development, release dominant trees, improve conditions for development of understory vegetation and canopy, and increase the numbers of redwood relative to Douglas-fir. There will be a greater overall long-term benefit in less time on the 361 acres that are moderately thinned because more trees will be cut, a greater number of canopy gaps will be created, and the remaining trees will grow at a faster rate. Overall there will be a minor to moderate benefit to understory vegetation and canopy development within several decades under the selected action. Under the low intensity thin prescription on 503 acres, forest recovery will occur more slowly because fewer gaps in the canopy will be created and fewer trees will be removed.

Removing the merchantable trees on 361 acres will mitigate the short-term increase in fire hazard caused by the increase in woody debris from cutting trees. The fire hazard in treated areas will decrease within about 10 years, as the fuels left in contact with the ground decompose. This will be a minor long-term benefit to the forest in the project area and will be a negligible benefit to forest stands outside the project area.

There will be no adverse effects on old growth forest or residual old growth trees in the 104 acres of old growth buffer under the selected action or the low intensity thin alternative. Over the long-term, there will be a moderate benefit to old growth forest community function in the contiguous old growth stands from thinning adjacent forests. The benefit will not be realized for centuries until the thinned forest re-attains the structure of old growth forest.

Thinning in the 142 acres dominated by tanoak will be a moderate, long-term benefit to individual conifers selected for release and a negligible long-term benefit to other forest stands in the project area. The effects under the low intensity thin alternative will be the same as under the selected action in this portion of the project area.

Short-term adverse effects on park forests from cutting second growth trees will be negligible because the trees occur in unnaturally high stand densities, are undersized compared to trees in unlogged stands, and are not representative of original forest species composition. The effect of moderate intensity thinning on 361 acres will be a negligible short-term adverse effect and a moderate long-term benefit in the project area. The effect of low intensity thinning (Alternative 3) would be the same as under the selected action, except the long-term benefit would be realized over a longer period of time. Effects on second growth forests in the project area under the no action alternative are described under cumulative effects.

Cumulative Effects on Vegetation—Logging had a significant adverse effect on old growth redwood forest communities that will continue for centuries. The cumulative benefit to park forests under the proposed action or the low intensity thin alternative will be minor because the area treated will be less than 1% of the second growth forests in the park. The 48,300 acres of

previously clearcut second growth forests in RNSP that are not treated will remain in a degraded condition. Logged areas of the parks will continue to recover although the recovery in some dense second growth stands that were not thinned after replanting will require centuries before the forest re-attains characteristics and functions associated with old growth forest.

Old growth forest and residual old growth and mature trees are protected throughout the parks, including the project area, and are not adversely affected by park actions.

Cumulative adverse effects on vegetation in the parks and the surrounding region result from logging and associated road construction, and residential, commercial, industrial, agricultural, and transportation development and use. The most significant cumulative effect on vegetation in the parks occurred prior to park establishment and expansion from the logging of about 50,000 acres of original coniferous forest, mostly in the Redwood Creek watershed. Park projects that affect vegetation include watershed restoration projects, maintenance of roads and trails, restoration of the Bald Hills grasslands and oak woodlands through removal of encroaching Douglas-fir, and fire management. Areas of the park with Port-Orford-cedar are being managed to reduce the spread of Port-Orford-cedar root disease, in cooperation with the U.S. Forest Service and the Bureau of Land Management throughout the range of Port-Orford-cedar. Sudden Oak Death, caused by a pathogen closely related to the root disease agent, is also expected to adversely affect park vegetation but the degree of effect is not yet known. The Sudden Oak Death pathogen has not been detected in the parks at this time.

Effects on Wildlife—Short-term effects on wildlife during project operations under the selected action will be negligible to minor, depending on the species tolerance to disturbance and ability to move out of the project area. Adverse effects on individual animals will be significant for those individuals that are killed during project operations but direct effects on any population in the project area will be negligible because there is similar second growth habitat throughout the parks and the second growth habitat that will be affected by project work is of poor quality.

Thinning will improve wildlife habitat immediately by creating openings in the canopy and reducing stand density, which will allow wildlife to move more freely within the forest. Within two to three years, understory vegetation that provides shelter and food for small wildlife will increase. Trees of outstanding character (deformed trees, large hardwoods, redwood stump sprouts) will be protected by directionally felling trees away from these specimen trees. These techniques will have a minor to moderate indirect benefit to wildlife that use specimen trees for nesting. Over the long-term, the height differential between the second growth and old growth forests will be reduced, reducing edge effects such as increased predation threat and microclimate changes that affect wildlife. This will be a long-term moderate benefit to wildlife in the project area and the adjacent old growth forests and a negligible long-term benefit to wildlife outside the project area. The benefit will occur under both the selected action and the low intensity thin alternative.

Under the no action alternative, there would be no short-term adverse effects on wildlife from noise, disturbance, and cutting of trees. Large tracts of unmanaged second growth in the project area and throughout the park will continue to be poor quality wildlife habitat for many decades The adverse effects on wildlife populations under the no action alternative are gradually lessening but will persist for centuries as the forest recovers.

Cumulative Effects on Wildlife—Cumulative adverse effects on wildlife in the parks relate primarily to activities outside the parks including loss or conversion of habitat for agricultural, residential, commercial, and transportation development; mortality from vehicle collisions along U.S. Highway 101 and other high-speed roads; and illegal poaching of elk and deer. These effects are negligible to significant, depending on the species, its degree of mobility and its tolerance of human presence and disturbance. Some individual animals benefit in the short-term from the presence of humans who leave trash that serves as a food source, and from disturbance due to logging, which increases forage for some species as vegetation regrows. However, in the long-term, human food sources have a moderate to significant adverse effect on individual animals that become accustomed to unhealthy food sources or are killed if they become a nuisance or cross highways to get to or search for food. Other park actions that affect wildlife include watershed restoration, control of non-native plants, fire management, and maintenance of facilities. The cumulative effects on wildlife from park actions in the short-term tends to be adverse, localized, and negligible because much wildlife habitat is still recovering from the adverse effects of logging and road construction prior to park expansion. Park resource management projects have long-term minor to moderate benefits on wildlife species from restoration of habitat and because the parks serve as a refugium from disturbance.

Effects on Rare, Sensitive, Threatened, and Endangered Species—There are no sensitive plant species known to occur within the project area that will be affected by management of second growth forests, under either the selected action or the low intensity thin alternative. The NPS determined that the selected action will not affect listed fish species or their critical habitat; NMFS agreed with this determination. The no action alternative and the low intensity thin alternative will not affect fish.

USFWS Biological Opinion 8-14-2006-2836 concurs with the NPS determination that the selected action may affect but is not likely to adversely affect the northern spotted owl and that the selected action may affect and is likely to adversely affect the marbled murrelet.

The selected action will alter approximately 1539 acres of suitable northern spotted owl habitat. The habitat is poor quality and the short-term adverse effects on owls from habitat alteration will be negligible. Retaining and protecting deformed trees and snags will have a minor to moderate indirect benefit to northern spotted owls that use such trees for nesting. There will be long-term benefits to northern spotted owls under the selected action from habitat improvement through acceleration of development of late-successional forest structure.

In the old growth forest buffer, low intensity thinning will maintain sufficient canopy cover to prevent rapid shrub proliferation and minimize the creation of food resources for corvids. This will be a minor indirect long-term benefit to marbled murrelets and northern spotted owls from minimizing nest predation.

The selected action will cause direct adverse effects on marbled murrelets from harassment from noise from chainsaws, felling, hauling, yarding, and truck traffic on 237 acres of occupied nesting habitat for one breeding season and 30 acres of occupied nesting habitat for three breeding seasons. An additional 164 acres of murrelet nesting habitat will be modified due to proposed thinning (5 acres of occupied residual stands, 89 acres of unoccupied residual stands, and 70 acres of occupied old growth forest.) These effects are considered moderately adverse. The NPS has requested, and the USFWS authorized, incidental take of marbled murrelets for these adverse effects. The number of acres of nesting habitat subject to disturbance will be minimized by

implementing daily limited operating periods for noise-generating work. Over the long-term (decades to centuries), the proposed action will accelerate development of late-successional forest structure and murrelet habitat on 1710 acres of second growth forest, which will increase the amount, quality, and distribution of murrelet habitat. Improving stand characteristics in second growth forest will increase murrelet reproductive success by reducing edge effects along the old growth forest, increasing quality of habitat in residual stands, and reducing potential for nest predation. These long-term indirect benefits to murrelets will be moderate adjacent to and within the project area, and negligible for murrelets elsewhere in the park.

Long-term benefits to northern spotted owls will occur more quickly than long-term benefits to marbled murrelets because owls are able to occupy advanced second growth forest for nesting and foraging but marbled murrelets require old growth habitat for nesting that will take centuries to develop.

Effects to northern spotted owls and marbled murrelets under the low intensity thin alternative would be the same as under the selected action, with the exception of the effects from 361 acres that are moderately thinned under the selected action. On these 361 acres under the low intensity thin alternative, there would be no direct adverse effects from hauling and yarding but the reduction in adverse effects would be negligible because noise from chainsaws and felling would adversely affect murrelets.

There would be no short-term adverse effects on marbled murrelets or northern spotted owls under the no action alternative. Long-term adverse effects on marbled murrelets and northern spotted owls under the no action alternative are the same as cumulative effects.

Cumulative Effects on Rare, Sensitive, Threatened, and Endangered Species—Almost all activities in RNSP affect federally listed threatened species because the forests and streams in the parks are occupied by northern spotted owls or marbled murrelets, and coho and Chinook salmon, and steelhead trout. Fire management through out the parks will have minor long-term benefits to sensitive species from reduction in fuel levels, which reduces the potential for catastrophic wildfires. On-going and planned projects and activities for which the NPS consults with either USFWS or NMFS for potential effects on listed, proposed, and candidate species include road, trail and facility maintenance and construction; watershed restoration; non-native plant management; management of vegetation in the Bald Hills; helicopter and off-road vehicle use; and beach management. The NPS has been authorized incidental take of listed species, primarily northern spotted owls, marbled murrelets, and juvenile anadromous salmonids, by the USFWS and/or NMFS for some of these activities. On-going and reasonably foreseeable NPS actions will not jeopardize the continued survival of any listed threatened species.

Outside the parks, the primary activities that affect listed threatened and endangered species are loss of habitat from logging, residential, industrial, and agricultural development; dams for power development, flood control, and water supply for domestic, industrial, and agricultural activities; and residential, commercial, industrial, agricultural, and recreational development projects that reduce the quality of habitat or decrease the quantity of habitat. Sport and commercial fishing also affect anadromous fish over both the short- and long terms. The cumulative effects on some species and their habitat are widespread, adverse, long-term, and significant, and have resulted in the listing of these species as threatened.

Effects on Cultural Resources—No historic resources listed or eligible for listing on the National Register of Historic Places will be adversely affected by the selected action, the low intensity thin alternative, or the no action alternative. The bear-grass site along Holter Ridge Road will be marked to protect it from being cut during brushing or damaged by equipment used for road maintenance or access to the project area.

Cumulative Effects on Cultural Resources—Other on-going and proposed activities in the parks that have the potential to affect cultural resources include fire management, watershed restoration, management of Bald Hills prairies and oak woodlands, management of non-native plants, and maintenance and construction of trails and other facilities. The cultural sensitivity of the coniferous forest where watershed restoration will occur is very low because these areas were logged or affected by road construction, which very likely damaged or destroyed any cultural resources originally present. Invasive non-native plants occur primarily in areas affected by recent human disturbance.

Cultural resource surveys are conducted prior to any work involving ground disturbance. Cultural resources in areas of known cultural sensitivity are protected by avoiding or minimizing ground disturbance. No significant adverse effects to cultural resources are anticipated from any reasonably foreseeable park actions.

Effects on Visitor Experience and Visual Quality—There are no visitor facilities or activities in the project area. Visual quality is low because of the impaired condition of the forest. Under the no action alternative, visual quality would not improve until the forest more closely resembles the appearance of old growth forest, which is estimated to take centuries. The selected action will not affect visitor experience. The low intensity thin alternative and the no action alternative will not affect visitor experience. Over the long term, visual quality in the project area will improve under the selected action and the low intensity thin alternative within a few years as trees grow larger and understory develops.

Cumulative Effects on Visitor Experience and Visual Quality—Opportunities for hiking, mountain biking, equestrian use, and primitive camping are being proposed as part of a comprehensive trail plan for RNSP. Other recreational opportunities in the vicinity include sport fishing in the Smith and Klamath Rivers and the ocean; sea kayaking and surfing; whitewater boating on the Smith River; the Smith River Rancheria casino on Highway 101 north of Crescent City; and the Elk Valley Rancheria Casino on Howland Hill Road that will be replaced by a larger casino resort along Highway 101 south of Crescent City; camping and hiking in RNSP, Six Rivers National Forest, and the Smith River National Recreation Area (NRA); scenery and wildlife viewing and photography in RNSP, Tolowa Dunes State Park, the national forest, the NRA, and Pelican Bay State Beach and other beaches in Del Norte County; and many additional recreational activities available in Crescent City, Del Norte County, and southern Oregon.

Effects on Adjacent Communities—Under the selected action, the NPS will contract with logging contractors to remove merchantable trees on 361 acres. Should the contract for the selected action be awarded to local contractors, there will be an economic benefit that is likely to contribute to the local economy. The degree of economic benefit will depend on the market price of wood products.

Cumulative Impacts on Adjacent Communities—It is not possible to describe all the past, present, and reasonably foreseeable actions that have affected or might affect communities adjacent to the

parks, particularly the community of Orick. The most significant factor in the economy of Orick is the decline of timber-based economy following the establishment and expansion of Redwood National Park, gradual decrease in timber supply available to local mills, and increased regulation of timber operations to protect watersheds and endangered species. The NPS is providing technical assistance to the community of Orick, and participating with other public and private entities for planning for watershed protection for Redwood Creek, including development of a community wastewater system and restoration of the Redwood Creek estuary.

Conclusion—As summarized above, the effects of the selected action have been considered and determined to be less than significant. These effects have also been considered under the criteria for significance listed in the Council on Environmental Quality regulations (40 CFR 1508.27) and found to be less than significant. Actions for which mitigation can be prescribed, the prescribed mitigation, and the responsible party are summarized in the following table.

Summary of Effects and Mitigation for South Fork Lost Man Creek Second Growth Restoration

Resource & Effect	*Mitigation*	*Responsible Party*
Air Quality: short term adverse effects from construction dust, vehicle emissions	Water trucks for dust abatement; vehicle emissions regulated to state standards	NPS: park vehicle maintenance; Contractor: dust control & vehicle maintenance;
Soils: disturbance from yarding logs	All soils previously disturbed by logging and road construction	Contractor: mulching for erosion control
Water Quality: erosion from disturbed soils	Best management practices incorporated into project design to avoid damage to watercourses; spill prevention plan (SPP) required	NPS: develop spill prevention plan; Contractor: BMPs implemented during construction, comply with SPP
Wetlands: generally avoided	Best management practices incorporated into project design to avoid wetlands	Contractor: implement BMPs during operations, comply with SPP
Vegetation: old growth and specimen trees retained and protected	Trees felled away from old growth or specimen trees	Contractor: fall trees away from old growth or specimen trees
Wildlife: day-time disturbance from equipment and personnel for several weeks between June and mid-October	No mitigation prescribed for disturbance to species tolerant of on-going human disturbance; remove all food scraps and trash to avoid attracting scavengers and habituating wildlife to people and human food sources	NPS, contractors: remove food scraps and trash
Sensitive Species: noise and disturbance to threatened birds	daily limited operating periods (DLOP) to protect murrelets in portions of the project area	Contractor: observe DLOPs

Resource & Effect	*Mitigation*	*Responsible Party*
Cultural Resources: no National Register-eligible resources affected	All ground-disturbing activities monitored; work will cease if resources encountered until resources can be evaluated	NPS, contractor: cease work if cultural resources encountered and notify NPS archeologist
Visitor Experience: no visitor facilities in project area	No direct effect on visitors because no existing visitor facilities in project area; locked gates prevent unauthorized vehicle access; signs requiring hard hats in heavy equipment operations areas	NPS, contractors: comply with all safety regulations for heavy equipment while using roads open to the public

Non-Impairment of Park Resources and Values

Non-Impairment of Air Quality—The selected action will not have long-term adverse effects on air quality or air quality related values in the parks. Short-term adverse effects on air quality from the selected action will be negligible to minor. Therefore, the selected action will not impair air quality or air quality related values in the park. The adverse effects on air quality from vehicle and equipment emissions, from dust from driving on unpaved roads to and from the project area, and from yarding trees, will be localized, short-term, and negligible to minor, and are therefore acceptable.

The no action alternative would not affect air quality or air quality related values and therefore would not impair air quality or air quality related values. The effects on air quality and air quality related values under the low intensity thin alternative would be slightly less than under the selected action because fewer trees would be cut on 361 acres and there would be no dust generated by removing merchantable trees from the 361 acres. Therefore, the low intensity thin alternative would not impair air quality or air quality related values in the park.

Non-Impairment of Soils and Topography—Soils and topography in portions of the project area were impaired by the original logging and road construction. The impairment to soils and topography caused by previous land use would continue under the no action alternative. Impairment to soils is gradually being reduced as vegetation regrows and soil formation processes act over the long-term. Topography in portions of the project area will remain altered, and in some areas impaired, by the original tractor logging and road construction until watershed restoration treatments are implemented.

Under the selected action, there will be no further alteration to topography because existing skid trails and landings will be reoccupied and existing roads would be used for access. Adverse effects to previously disturbed soils from compaction by work crews, and from heavy equipment on stable soils on slopes 30% or less, will be short-term and negligible. Any areas of soil exposed or damaged by heavy equipment will be rehabilitated after thinning operations are completed. Adverse effects to soils on slopes steeper than 30% will be avoided by prohibiting heavy equipment operations here and by using cut trees and branches as mulch to reduce erosion. These short-term adverse effects on soils are acceptable because the soils are previously disturbed and because restoration of forests will result in long-term benefits to forest soils by minimizing new erosion and by restoring conditions that promote soil formation processes.

Therefore, the selected action will not cause further impairment to soils or topography, and will reduce the logging- and road-related impairment to soils over the long-term by promoting soil formation processes as the forest regrows.

Under Alternative 3 (low intensity thinning), there will be no further alteration to topography. Effects to soils under the low intensity thin alternative will be slightly less than under the selected action because there fewer trees would be cut on 361 acres of the project area and no heavy equipment would be used to skid or yard merchantable trees. Other effects on soils under the low intensity thin alternative are the same as under the selected action. Therefore, the low intensity thin alternative would not impair topography or soils.

Non-Impairment of Water Resources, including Water Quality, Floodplains and Wetlands—Water quality, floodplains, and riparian wetlands in portions of the project area were impaired by logging and road construction prior to becoming part of the park. This impairment to watersheds was a primary reason for park expansion. The effects on watersheds in the park from past logging and the resulting park expansion legislation are directly responsible for the definition of impairment and the "no derogation" standard that applies to management of all units in the national park system (Management Policies 2006). If major storms cause roads to fail, and eroded sediment enters a perennial stream, water quality and riparian wetlands might be impaired in some areas depending on the intensity of the storm and the extent of erosion. Therefore, the existing impairment to water quality and riparian wetlands in the project area and floodplains downstream will continue but will gradually decrease over the very long-term as areas recover or as restoration projects are implemented. The no action alternative would not create additional effects to water quality, floodplains, or riparian wetlands.

Floodplains will not be affected under the selected action or the low intensity thinning alternative. Streamside protection zones and best management practices will avoid or minimize adverse effects on water quality and riparian wetlands from thinning of second growth forests. Therefore, water quality and riparian wetlands will not be impaired under either thinning alternative. The negligible indirect adverse effects on water quality and riparian wetlands from minor soil disturbance under the selected action would be acceptable because these resources would benefit over the long-term from restoration of forests.

Non-Impairment of Vegetation Resources—The project area was logged between the 1950s and the mid-1970s. The original vegetation community was impaired by logging. Under the no action alternative, the impairment to park forests from logging will continue for centuries.

The existing vegetation is second-growth forest and shrubs that have regrown following logging, with individual trees that were not cut scattered through the project area as residuals. No trees larger than 24" diameter at breast height will be removed under either thinning alternative. Old growth forest will be protected under the selected action and the low intensity thin alternative using a specific prescription to avoid creating the potential for wind-damage along the old growth forest edge.

Therefore, the selected action will not cause further impairment to park plant communities or vegetation and will initiate a reduction in the impairment to the original plant communities caused by logging in the project area and other areas of the park prior to park establishment.

Under the low intensity thin alternative, the impairment to park forests will be reduced more slowly on the 361 acres that are thinned with a low intensity prescription as compared to a moderate intensity thin under the selected action.

Cutting of trees under the selected action is an acceptable impact because it is required to achieve the purpose of the project, which is to reduce the time required for second growth forests to re-attain the structure and function of old growth forests. Use of silvicultural techniques to accelerate recovery of second growth forests is described in the 1999 GMP/EIS as necessary to achieve the desired future condition of park forests.

Non-Impairment of Wildlife and Fish Resources—Neither the selected action nor the low intensity thin alternative will have direct adverse effects on fish because there are no fish-bearing streams that will be affected by management of second growth forest in the project area. There will be negligible indirect benefits to fish over the very long term from management of second growth forests under either thinning alternative. Therefore, fish populations will not be impaired by implementation of the selected action or by low intensity thinning. The impairment to fish populations in park streams outside the project area, including Redwood Creek, will continue but is lessening as the habitat recovers, watershed management practices outside the parks improve, and watershed restoration occurs both in and outside the park.

Under the no action alternative, the impairment to fish populations caused by direct loss of habitat outside the project area and widespread erosion resulting from the original logging and road construction would continue. However, leaving the second growth forest in the project area unmanaged would not cause further impairment to fish as the forests gradually recover without additional manipulation.

Despite the poor quality habitat in second growth forests in the project area, there is sufficient good quality habitat remaining elsewhere in the park to support wildlife populations. The original logging caused an impairment to park wildlife populations from destruction and degradation of habitat but that impairment is gradually decreasing as forests develop without active silvicultural management (no action).

There will be negligible short-term adverse effects on individuals of small, less mobile wildlife species during thinning operations under either thinning alternative and minor to moderate long-term benefits to all wildlife from improvement of habitat as the forest, understory, and canopy develop following thinning. Second growth forest restoration under either thinning alternative will have long-term benefits as habitat improves. Therefore, the selected action will not impair wildlife resources. The short-term adverse effects from thinning are acceptable because the existing habitat that will be affected by the selected action is poor quality and will be improved by thinning.

Non-Impairment of Sensitive, Threatened and Endangered Species—Thinning second growth forests will not affect listed fish species or their critical habitat, and therefore will not cause an impairment to sensitive fish resources. Under the no action alternative, the impairment to fish populations caused by direct loss of habitat outside the project area and widespread erosion resulting from the original logging and road construction would continue. However, leaving the second growth forest in the project area unmanaged would not cause further impairment to listed fish or their critical habitat as the forests gradually recover without additional manipulation.

The NPS determined, and the USFWS concurred, that the selected action may affect but is not likely to adversely affect northern spotted owls. The low intensity thin alternative would have fewer short-term adverse effects on owls because fewer trees would be removed but the long-term benefits would require a longer time to occur because the remaining trees would not grow as fast as under the proposed action (moderate thin alternative). The no action alternative would continue to have both short- and long-term adverse effects on owls because habitat quality would remain low. The selected action and the low intensity thin alternative will not increase the existing impairment to spotted owl populations but the level of impairment under the no action alternative would persist significantly longer than under the selected action or the low intensity thin alternative. Range expansion of the barred owl is increasing the potential for impairment to spotted owl populations but active management of second growth forests will not affect the process of barred owl range expansion. The short-term adverse effects on owls from short-term alteration of poor quality habitat under the selected action and the low intensity thin alternative are acceptable impacts that results from implementation of the management direction outlined in the 1999 GMP/EIS, the USFWS recovery plan for the northern spotted owl, and the 1978 legislation expanding Redwood National Park.

The USFWS concluded that implementation of the selected action will not affect designated critical habitat for the marbled murrelets and is not likely to jeopardize the continued existence of marbled murrelet because the modification of habitat and harassment are relatively short-term and are not expected to have a long-term adverse influence on murrelet numbers and reproduction. The USFWS authorized incidental take from harassment (noise and disturbance) on 237 acres of occupied nesting habitat for one breeding season and 30 acres of occupied habitat for three breeding seasons, and from modification of 164 acres of nesting habitat. The USFWS believes that the adverse impacts of the proposed action will be minimized by measures incorporated into project design. The biological opinion issued by the USFWS for the proposed action reiterated that the USFWS recovery plan for the marbled murrelet identifies silvicultural techniques such as thinning to increase the rate of developing new murrelet habitat as an action that must be taken to prevent a significant decline in murrelet populations or habitat quality. Therefore, the selected action will not cause an impairment to marbled murrelets. The short-term adverse effects on murrelets from noise disturbance under the selected action are acceptable impacts that would result from implementation of the management direction outlined in the 1999 GMP/EIS, the USFWS recovery plan for the marbled murrelet, and the 1978 legislation expanding Redwood National Park.

Although short-term adverse effects to threatened bird species under the low intensity thin alternative would be less under the low intensity thin alternative because there will be less noise disturbance associated with skidding, yarding, and removing merchantable, the long-term benefit to marbled murrelets and northern spotted owls would require longer because the forest would not recover as quickly as under the selected action. Therefore, although there would be no impairment to populations of threatened bird species under the low intensity thin alternative, the impairment to these species would not be reduced as quickly as under the selected action.

Non-Impairment of Cultural Resources— No adverse effects to historic properties are anticipated in the project area under the selected action, the low intensity thin alternative or the no action alternative. Therefore, there will be no impairment to cultural resources from management of second growth forests.

Thinning trees as described under the proposed action is acceptable because there would be no adverse effects to cultural resources. Similarly, thinning trees as described under the low intensity thin alternative would be acceptable because there would be no adverse effects to cultural resources.

Basis for Decision

Based on the environmental assessment, together with consideration of public interest and the relation between public interest and laws, statutes, and regulations for managing NPS units, the ability of the mitigation measures to reduce or eliminate adverse impacts, and the concurrence of agencies and affiliated American Indian tribes that were consulted, the NPS is selecting Alternative 2: Moderate Intensity Thinning with Biomass Removal for Fuels Reduction. Implementing this action is necessary to reduce impairments to soil, water, and forest conditions.

It is the determination of the National Park Service that the selected action in Redwood National Park to thin second growth forests on 1700 acres in the South Fork Lost Man Creek watershed and remove woody biomass for fuel reduction does not constitute a major federal action significantly affecting the quality of the human environment, nor is this project without precedent or similar to ones that normally require an environmental impact statement. Therefore, in compliance with the National Environmental Policy Act, the National Park Service will not prepare an environmental impact statement, and will proceed with implementation of the selected action as soon as practicable.

Recommended: Steve W. Chaney 3-9-09

Steve W. Chaney
Superintendent
Redwood National Park

Date

Approved: Jonathan B. Jarvis 3-10-09

Jonathan B. Jarvis
Regional Director
Pacific-West Region

Date