

**Finding of No Significant Impact
Strawberry Creek Restoration
Redwood National Park
Humboldt County, California**

This Finding of No Significant Impact (FONSI) should be attached to the Strawberry Creek Restoration Environmental Assessment (EA) dated February 2014. This FONSI together with the EA constitutes a complete record of the conservation planning and environmental impact analysis process for this proposal. In addition, the park manager's determination that no impairment will result from the selected action is attached.

The NPS will implement as its selected action Alternative 2 as presented in the EA, which was also identified as the proposed action. No comments were received that required corrections to the EA nor changes to Alternative 2, which describes a project that is well understood and supported by agencies, stakeholders, organizations, and the general public throughout the local area and the region. The selected action is one of three alternatives that were identified and analyzed in the EA. A no action alternative and a more extensive restoration alternative were also considered.

Under the selected action, the NPS will re-establish about 1,600 linear feet of free-flowing stream and side channels by removing reed canary grass and excavating channels of varying depth and width; install in-stream rock and wood structures to support channel function and stability and to provide fish habitat; re-establish riparian canopy by planting native trees and other native plants; replace an undersized culvert on the road to the former South Operations Center (SOC) that can be negotiated by fish to move into upstream habitat ["fish-friendly"] and can accommodate a 100-year recurrence interval storm event; and remove sediment sources at four stream crossings on abandoned logging roads in the headwaters of Strawberry Creek upslope of the stream valley.

It is NPS policy to strive to restore the integrity of park resources that have been damaged or compromised in the past (NPS 2006 1.4.7.2). *Management Policies 2006* allows NPS intervention in natural biological and physical processes to restore natural ecosystem functioning that has been disrupted by past or ongoing human activities (NPS 2006 4.1). The Strawberry Creek restoration project is intended to restore stream functions, especially habitat for anadromous salmonid fish now listed as threatened species, within a portion of a wetland that has resulted from past alteration of the creek for agricultural purposes.

Redwood National Park was established by Congress in 1968 to "preserve significant examples of the coastal redwood ... forests and the streams ... with which they are associated for purposes of public inspiration, enjoyment, and scientific study." [Public Law 90-245]. Congress expanded Redwood National Park in 1978 and authorized the NPS to develop a program for the rehabilitation of logged and roaded watersheds "to reduce risk of damage to streamside areas and for other purposes" [Public Law 95-250, Section 101(a) (6)]. Since 1978, the NPS has been conducting watershed restoration activities in accordance with the legislation. Removal of the four stream crossings on abandoned logging roads will be undertaken as part of the watershed restoration program.

This environmental assessment (EA) is tiered off the 1999 Redwood National and State Parks *Final General Management Plan/General Plan, Final Environmental Impact Statement/Environmental Impact Report* (RNSP GMP/FEIS) approved through the 2000 *Record*

of Decision. The 1999 GMP/FEIS described a program to treat stream crossings on abandoned logging roads to reduce the potential for erosion. The selected action to remove four stream crossings on abandoned logging roads in the upstream portion of Strawberry Creek watershed will be implemented as part of the watershed restoration program described in the GMP, as directed by the 1978 expansion legislations. The selected action to restore a segment of Strawberry Creek as an anadromous fish stream draining into the Redwood Creek estuary is consistent with the direction in the GMP to collaborate with other federal, state, and local agencies; conservation organizations; and affected landowners to restore natural functioning to the estuary.

Purpose and Need for Strawberry Creek Restoration

The purpose of the project is restore the structure and hydrologic and biological functions of Strawberry Creek by removing invasive vegetation and excavating a channel to re-establish a free-flowing stream and side channels; re-establishing a riparian corridor planted with native vegetation to assist in the control of invasive plants in and adjacent to the stream channel; replacing a culvert that impedes fish passage and alters natural hydrologic and geomorphic processes; and eliminating sources of erosion to reduce sediment delivery into the stream.

Two species of anadromous salmonids that have been found in Strawberry Creek downstream of the NPS project area are listed as threatened under the federal Endangered Species Act, Southern Oregon/Northern California Coast (SONCC) coho salmon and Northern California (NC) steelhead. Coho salmon are also listed as threatened under the California Endangered Species Act. This action is needed to enhance populations of threatened salmonid fish species through restoring access to designated critical habitat and improving water quality and biological productivity in stream channels to support non-natal rearing of salmonids.

Selected Action

The selected action is Alternative 2: Strawberry Creek Restoration which is identified in the EA as the proposed action. There are no changes in actions, mitigations, or other key elements of the selected action, as compared to Alternative 2 presented in the EA.

Alternatives Considered in the Environmental Assessment

The February 2014 EA described three alternatives:

- Alternative 1: No Action.
- Alternative 2: Strawberry Creek Restoration (Proposed Action).
- Alternative 3: More Extensive Restoration.

Under the no-action alternative (Alternative 1), invasive reed canary grass and other vegetation would not be removed or channels excavated to create defined free-flowing stream channels within the palustrine emergent wetland. Existing culverts under the SOC Road would remain smaller than needed to accommodate a 100-year storm event. The NPS would perform routine periodic maintenance of the existing culverts by removing accumulated debris from the culvert inlets and would replace the culverts when they no longer convey water beneath the road. The upslope stream crossings on abandoned logging roads would remain in their present configuration and condition and would not receive any treatment to reduce erosion.

Under the selected action (Alternative 2 in the EA),

- invasive reed canary grass and other vegetation will be grubbed from stream channels and piled at the SOC maintenance storage yard to decompose naturally;

- about 1,600 linear feet of stream channel will be excavated affecting 2.2 acres in the wetland and about 0.7 ac of non-wetland soils and vegetation;
- about 386 linear feet of the West Tributary will be realigned and/or excavated to restore hydrologic function;
- 12 log steps and weirs, 20 rock structures, 7 wood habitat structures, and 10 nurse logs will be constructed and/or placed in stream channels to support channel function and stability and to provide fish habitat;
- four stream crossings in the upper watershed will be excavated and reshaped as closely as possible to the original landform;
- excavated earthen material supplemented with additional material obtained off-site will be used to create mounds adjacent to the stream channel that will be planted with native trees and other native plants to create a riparian zone to inhibit re-growth of reed canary grass through shading;
- planted areas will be fenced to prevent elk and beaver from damaging new plantings;
- the West Tributary culvert under the SOC Road will be replaced with a “fish-friendly” culvert that allows passage for all life stages of fish and is sized for 100-year recurrence interval flows; and
- a water line and telephone line will be temporarily relocated.
- Stream restoration and culvert replacement will affect about 5.6 acres for equipment access, grubbing, excavating, and stockpile areas, and about 0.44 acres for stream crossing removal and restoration.

Actions undertaken under the more extensive restoration alternative (Alternative 3) would be similar to those under the selected action with the following differences. Under the more extensive restoration alternative, approximately 500 additional linear feet of the Strawberry Creek upstream of the SOC Road culvert nearest the former administrative facility would be realigned and reshaped. That culvert would be replaced with one sized to accommodate the 100-year flow event. A log stringer bridge would be removed. Additional log and wood instream and habitat structures would be installed in the main channel and West Tributary. An additional 56 linear feet of the West Tributary would be restored, which would affect the roots of two 24-inch-diameter Sitka spruce. The limits of disturbance needed for equipment access, stockpile areas, grubbing, and excavating for the stream restoration portion of the project cover about 6.5 acres.

Environmentally Preferable Alternative

The Council on Environmental Quality’s National Environmental Policy Act (NEPA) regulations and the National Park Service NEPA guidelines require that “the alternative or alternatives which were considered to be environmentally preferable” be identified (40 CFR 1505.2).

Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.” (CEQ 1981) The environmentally preferable alternative is based on an evaluation of the alternative using the criteria identified in Section 101 of NEPA stated below:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

- Preserve important historic, cultural and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
- Achieve a balance between populations and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources and approach maximum attainable recycling of depletable resources.

Both restoration alternatives involve

- Removal of invasive plants and replace them with native species;
- Restoration of the hydrologic and biological functions of a free-flowing stream channel;
- improving water quality through removal of invasive vegetation, restoration of hydrological patterns, and reduction of sediment input;
- improving habitat for threatened fish species by providing free-flowing channels, improving water quality, re-establishing instream cover, and providing access to additional stream reaches; and
- increasing habitat diversity by planting native riparian vegetation along the restored stream channels.

The NPS has determined that Alternative 3 (More Extensive Restoration) is the environmentally preferable alternative. Compared to the proposed action (Alternative 2), Alternative 3 would restore an additional 500 feet of the Strawberry Creek tributary above SOC, replace an additional undersized culvert through which that tributary flows which would increase the amount of fish habitat, and remove an old log stringer bridge to restore original conditions. These actions would increase the amount of designated critical habitat accessible to threatened coho salmon and steelhead trout.

Compared to more extensive restoration under Alternative 3, the selected action (Alternative 2) is not the environmentally preferred alternative because the undersized SOC Road culvert that is a barrier to passage of anadromous fish will not be replaced, there will be less stream channel restored upstream of this culvert, and the log stringer bridge will not be removed and the area restored to natural conditions. Although the selected action is similar to the more extensive restoration alternative, more extensive restoration is economically infeasible given available funding for both implementation and future maintenance of the constructed channel and plantings. The selected action meets the purpose and need of the project to restore habitat for threatened fish at a lower cost compared to the more extensive restoration alternative. Federal and state fisheries management agency staff have judged that the habitat quality of the additional 500 feet of stream channel upstream of the SOC Road that will not be restored under the selected action would be poorer quality than the habitat to be restored in the main channel and West Tributary and would not contribute appreciably to restoration of fish populations. Future channel restoration within the wetland area through removal of invasive plants, restoration of the additional 500 feet of stream channel in the reach upslope of the former SOC, replacement of the culvert, and removal of the log stringer bridge are not precluded under the selected action.

The no-action alternative is not the environmentally preferred alternative because it would not

- remove invasive plants;
- restore habitat for threatened fish species;
- restore more natural hydrological and biological functions of Strawberry Creek;

- reduce the potential for sediment delivery into the stream from eventual failure of the culverts under SOC Road and the West Tributary;
- remove the stream crossings upslope of the wetland to reduce erosion and potential for sediment delivery into the wetland; or
- increase habitat diversity through riparian plantings.

Public Involvement

The EA was available for review for a 38-day period from February 21 through March 30, 2014. Forty-seven printed or digital copies on CD-ROM of the EA and 53 letters announcing availability for review were sent to federal, tribal, state, and local agencies, elected officials, organizations, businesses, or individuals. Printed copies were available at park offices and five local libraries. A press release was sent to the 45 entries on the park media list, which includes local and regional newspapers, radio, and television stations. Some entities were notified by more than one method. All letters and the press release provided the internet address where the EA was posted on the NPS Planning, Environment, and Public Comment (PEPC) public site at parkplanning.nps.gov/StrawberryCreek. No additional requests for copies of the document were received on the EA. There was no media interest in this specific project although local stream restoration projects are occasionally covered in local newspapers. One telephone caller requested clarification on the location of the project after reading an announcement in a local weekly paper and expressed support for the restoration actions. One written comment was received that questioned whether the selected action would successfully achieve the restoration goals.

Clean Water Act and Endangered Species Consultations

The NPS submitted an application to the US Army Corps of Engineers, San Francisco District, on November 19, 2012 for a Department of the Army permit ("Section 404 permit"). The Corps issued Department of the Army Permit No. 2009-0041N on January 3, 2014 to the NPS for Strawberry Creek restoration actions.

The National Oceanographic and Atmospheric Administration Restoration Center (NOAA RC) issued a Biological Opinion and Essential Fish Habitat (EFH) consultation on March 21, 2012 (2011/06430) that pertains to NOAA RC proposed funding and Corps proposed permitting of restoration projects within the National Marine Fisheries Service's (NMFS) Northern California Office jurisdictional area. On December 4, 2012, the NPS submitted an "Application for Inclusion in the NOAA RC Arcata Office Programmatic Biological Opinion." On January 31, 2013, NMFS determined that the Strawberry Creek restoration project fits within the scope of that program and is covered under Section 7a2 of the Endangered Species Act using the Corps permit as the federal nexus. The biological opinion covers the following activities that will be undertaken as part of the Strawberry Creek restoration: instream habitat improvements; instream barrier modification for fish passage improvement; bioengineering and riparian habitat restoration; upslope watershed restoration; and creation of off-channel/side-channel habitat features. Through the programmatic biological opinion, NMFS determined that these activities are not likely to jeopardize the continued existence of SONCC coho salmon or NC steelhead, and are not likely to result in the destruction or adverse modification of designated critical habitat for these species. The NOAA RC Biological Opinion authorizes incidental take for effects on listed fish related to dewatering, fish relocation activities, and instream construction activities. Non-discretionary reasonable and prudent measures and terms and conditions, and two additional discretionary conservation recommendations, are expected to reduce the amount or extent of incidental take of SONCC coho salmon and NC steelhead. NMFS concluded that the proposed activities will adversely affect EFH for coho salmon, but that the activities will be conducted

using adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

The NPS applied to the North Coast Regional Water Quality Control Board (NCRWQCB or Water Board) for a Clean Water Act Section 401 Water Quality Certification (401 certification) on February 28, 2014. The Water Board issued Public Notice for Water Quality Certification and/or Waste Discharge Requirements (Dredge/Fill Projects) for Redwood National Park Strawberry Creek Restoration Project WDID No. 1B14017WNHU Humboldt County on March 14, 2014. No comments were received by the Water Board during the 21-day review period ending on April 4, 2014. The Water Board issued Water Quality Certification for the project on April 8, 2014.

NPS determined that the selected action will have “no effect” to marbled murrelets and that restoration “may affect but [is] not likely to adversely affect” northern spotted owls. On June 9, 2009, the US Fish and Wildlife (USFWS) Arcata Fish and Wildlife Office issued a letter of concurrence (file code 8-14-2009-3622 81331-2009-I-0105) that the proposed action for restoration of Strawberry Creek will not affect marbled murrelets because it will not degrade or remove marbled murrelet nesting habitat and will not disturb marbled murrelets because no project-generated noise will occur in or within 0.25 miles of suitable nesting habitat between March 24 and September 15. The USFWS concurred with the NPS determination that the proposed action may affect but is not likely to adversely affect northern spotted owls because the total area of suitable nesting and roosting habitat degraded will be approximately two acres spread between the four stream crossings and the length of the haul road to be removed; trees removed will be less than 18 inches diameter at breast height (dbh); no potential nest trees will be removed; habitat suitability and function will be maintained; and down logs will remain on-site. No injury or harm to spotted owls is anticipated because no trees will be cut in suitable nesting or roosting habitat from February 1 through September 15.

Cultural Resource and Tribal Consultations

The NPS identified three cultural resources in the study area, none of which was determined eligible for listing in the National Register of Historic Places. In consultation with the Yurok Tribe, the NPS determined that restoration of Strawberry Creek will be consistent with Yurok values. The NPS submitted a determination of “No Historic Properties Affected” to the SHPO on November 21, 2013. The SHPO concurred with the NPS determination on December 23, 2013 (reference NPS100125A).

Strawberry Creek is located in the ancestral land of the Yurok people, who ascribe significance to all of the area’s natural and cultural resources including but not limited to Strawberry Creek and its entire ecosystem. The Yurok THPO and the Yurok Tribe’s culture committee have indicated that restoration of Strawberry Creek is consistent with Yurok values.

Floodplains and Wetlands Executive Orders

The NPS carries out its responsibilities to manage floodplains and wetlands in compliance with Executive Orders (EO) 11988 “Floodplain Management” and 11990 “Protection of Wetlands” under procedures described in Director’s Orders (DO) #77-1 Wetland Protection and #77-2 Floodplain Management and their associated implementation manuals.

The purpose of the selected action is to restore natural floodplain and channel functions and values in a small area. Such actions that are located in floodplains but do not adversely affect floodplain processes and functions and do not involve overnight occupation or present other human health and

safety issues may be excepted from the NPS requirement to prepare a floodplain statement of findings. After conferring with the NPS Water Resources Division wetland program leader, the NPS has determined that the selected action meets the requirements of this exception.

Under Section 4.2.1.h of NPS *Procedural Manual #77-1: Wetland Protection*, NPS actions designed specifically for the purpose of restoring degraded natural wetland, stream, riparian, or other aquatic habitats or ecological processes may be excepted from the requirement to prepare a wetland statement of findings. The NPS has determined that the selected action meets the requirements of this exception, and that the best management practices and conditions listed in Appendix 2 of the manual will be implemented as part of the selected action.

California Environmental Quality Act

The California State Clearinghouse received 15 copies of the EA on CD-ROM. In addition to six state agencies that received a printed copy or letter or electronic message announcing the availability of the EA for public review directly, the NPS recommended to the clearinghouse that three additional state agencies be notified of the availability of the document. No comments were received from the 13 state agencies listed by the clearinghouse as reviewing agencies for the project (SCH # 20140024001).

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 are significant. 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 mitigation measures to avoid or minimize effects on air quality, soils, hydrology, water quality, floodplains, vegetation, wildlife, threatened bird species, and cultural resources. Potential adverse effects to these resources have been determined to be negligible or minor, and will not require extensive mitigation on the part of the NPS to avoid or reduce the effects discussed below. Adverse effects to topography, water quality, wetlands, and threatened fish that were determined to potentially be greater than minor will be mitigated using multiple minimization measures and best management practices (BMPs) described in detail in the NOAA RC biological opinion, the Corps permit, and the references found in the EA. The extensive mitigation measures are summarized below.

Mitigation measures and BMPs will be implemented to protect water quality, stream habitat, and fish, including erosion control measures required under the California Department of Fish and Wildlife Fisheries Restoration Grant Program (CDFW FRGP) and the NOAA RC biological opinion. A complete list of required mitigation measures to minimize adverse effects on listed fish species from projects funded under the 2012 FRGP is found in the California Department of Fish and Game *California Salmonid Stream Habitat Restoration Manual, Third Edition*. Mitigation measures include grubbing and earth moving adjacent to active stream channels only at low streamflow periods; dewatering procedures for stream channels; fish screens; and fish relocation if needed. If work involves soil excavation adjacent to the active stream channel after October 15th, work sites will be “winterized” at the end of each work day to reduce the chance of erosion and run-off in the event of an unexpected rain storm. Work site winterizing, seasonal timing and other best management practices will be implemented to reduce short-term adverse effects from erosion on listed salmonids downstream of the project area.

Air Quality—Localized short-term adverse effects on air quality from vehicle emissions from heavy equipment from excavation of road fill for removal and replacement of the SOC Road

culvert and removal of the four stream crossings will be minimized by using vehicles licensed to meet California air quality standards. Decreased air quality from fugitive dust from excavation of the culvert and stream crossings will be negligible. Air quality will quickly return to very good to excellent when construction is completed.

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 unplanned wildfires. The North Coast Air Quality Management District coordinates planned ignitions in Humboldt, Del Norte, and Trinity Counties to minimize cumulative adverse smoke effects on local communities and highways. The cumulative effect on air quality in the parks from prescribed fires conducted in the park and on adjacent private timber lands for hazard fuel reduction will be short-term, adverse, localized and could range from negligible to moderate depending on wind and atmospheric conditions.

There will be negligible short-term and no long-term adverse effects on air quality in the project area, including cumulative effects, under the selected action.

Effects on Greenhouse Gasses and Global Climate Change—There will be a short-term increase in GHG emissions from heavy equipment used for construction. There will be no long-term effect on GHG emissions from the selected action. Cumulative effects from GHG emissions in the region are expected to increase over the long-term as the population of the region increases.

Effects on Soils and Topography—The selected action will have a minor localized benefit to soils and topography in the project area from excavation of 1,600 cubic yards of soils from the four stream crossings to prevent erosion of about 630 cubic yards of soils and to restore original landforms. The volume of soil mobilized during storm events as the four stream crossings adjust to the new configuration over one to two years is estimated to be a maximum of 24 cubic yards, depending on the number, intensity, and duration of storm events.

There will be long-term effects on soils and topography from excavation of 1,064 cubic yards of soil for channel excavation, replacement of the West Tributary culvert, and West Tributary channel. Creating planting mounds will require placement of 11,830 cubic yards of gravel and soil which will affect underlying soils and alter the topography.

Short-term effects on soils from erosion will be minor or negligible because of the BMPs and multiple minimization measures that will be implemented as part of the selected action.

Effects on topography and soils (road fill) for culvert replacement are negligible. Long-term effects on soils and topography to create new stream channels and planting mounds are adverse and moderate but unavoidable because they are necessary to meet the purpose and need for the project. About 30 acres of soils with properties similar to the excavated soils and those beneath the mounds will be undisturbed in the wetland outside the project limits of disturbance as well as on adjacent private lands in the vicinity.

The overall long-term effects on topography from removal of four stream crossings, and culvert replacement are judged to be beneficial and negligible from reduction of sediment threat to the Strawberry Creek watershed and restoration of the original landforms, and beneficial and moderate from alteration of topography for channel excavation and mound creation, which are necessary to meet the purpose of and need for stream restoration.

Topography in the other sub-basins of Redwood Creek will remain altered by former logging roads that have not been maintained or treated to reduce erosion. Soils will continue to erode in unstable areas along unmaintained or abandoned roads in the Redwood Creek watershed upstream of the Strawberry Creek watershed. Landslides related to untreated roads will cause adverse effects to soils and will occasionally alter topography, particularly after major storms. Long-term adverse effects on soils and topography from untreated roads will range from minor to significant, depending on the degree of alteration from the roads and on the magnitude of storms that result in erosion and can cause landsliding.

Removal of the four stream crossings, excavation for stream restoration and culvert replacement, and creation of planting mounds will have no effect on topography and soils in other sub-basins in the Redwood Creek watershed. Under the selected action, there will be a negligible cumulative long-term benefit on soils and topography in the Redwood Creek watershed outside the Strawberry Creek project area because of the widespread intensive alteration of soils and topography related to past logging and road construction.

Effects on Hydrology and Water Quality— The selected action will have long-term effects on hydrology from removal of reed canary grass, excavation to create stream channels and side channels, and installation of a culvert capable of accommodating a 100-year flow event. These actions will increase flow conveyance and allow free passage of 100-year flows. The long-term effects on hydrology and hydrologic functions in Strawberry Creek are judged to be beneficial and moderate.

Water quality will be protected through incorporating multiple mitigation measures and BMPs required for implementation of projects funded under the CDFW Fisheries Restoration Grant Program and prescribed in the non-discretionary terms and conditions of the NOAA RC biological opinion.

Mitigation measures include conducting instream activities during low flow periods in September and completing the project prior to the onset of the rainy season; using silt fences and other standard erosion control methods; and mulching of newly exposed soils. BMPs and mitigation measures will minimize short-term degradation of water quality by reducing soil erosion and sediment mobilization.

The BMPs will prevent petrochemical or other contaminant spills into soil or water and reduce water quality degradation from toxic chemicals associated with construction equipment to a negligible level over the short-term.

Under the selected action, there will be short-term localized adverse effects on water quality from erosion and mobilization of sediment from excavation of 1,064 cubic yards of soils to remove the culvert and create channels within the wetland and 1,600 cubic yards from removal of the four upslope stream crossings. The volume of soil mobilized as the four stream crossings adjust to the new configuration is estimated to be a maximum of 24 cubic yards over one to two years, depending on the number, duration, and intensity of the storm events.

Erosion of a maximum of 24 cubic yards from the restored stream crossings will have a negligible to minor adverse effect on water quality in the restored stream, depending on the number and intensity of the storm events. The sediment is expected to be trapped in vegetation and topographic irregularities in the drainage channel and released in small pulses over one to two years rather than in a single large pulse.

Removal of reed canary grass and creation of free-flowing stream channels will increase dissolved oxygen in the water which will be a long-term benefit.

The selected action will have negligible to minor short-term adverse effects on water quality from erosion of newly excavated soils over one to two years, and minor to moderate long-term benefits to hydrology and water quality from removing invasive vegetation and restoring hydrological functions through creation of free-flowing stream channels.

The cumulative effects on hydrology and water quality in the park relate primarily to past logging and road building, both within what is now the national park and in the Redwood Creek basin upstream of current park boundaries. Hydrologic patterns have been significantly altered and water quality significantly degraded by roads constructed for logging operations.

The U.S. Environmental Protection Agency (EPA) includes Redwood Creek on its 303(d) List of Impaired Water Bodies as a sediment-impaired and temperature-impaired stream as defined under Section 303 (d) of the Clean Water Act, and by the North Coast Regional Water Quality Control Board as water-quality limited due to clean sediment loading. (Impairment as defined under section 303(d) is a different standard than the NPS standard described in *Management Policies 2006*.) The water quality in Redwood Creek within the park upstream of the Strawberry Creek project area will continue to be adversely affected by erosion of unmaintained logging roads on unstable slopes upstream of the park and abandoned failing roads within other Redwood Creek subwatersheds in the park. Chronic small-scale and episodic large-scale erosion from both human-caused and natural sources will continue to adversely affect water quality in Redwood Creek within the park and in the estuary.

The selected action will have a negligible benefit to water quality in the mainstem of Redwood Creek because of the small reduction in erosion potential from removal of four stream crossings compared to the erosion potential remaining in the Redwood Creek watershed upstream of the project area. A major storm that causes erosion from untreated logging roads in the Redwood Creek watershed will have significant adverse effects on water quality in Redwood Creek that are proportional to the magnitude and duration of the storm.

The selected action will have a negligible effect on reducing sediment delivered to the Redwood Creek estuary. Water quality of the Redwood Creek estuary will not improve under the selected action because Strawberry Creek is a small tributary that enters the South Slough of the estuary, which is cut off from the main channel by the flood control levees.

Restoration of the Strawberry Creek channel will not affect hydrological conditions or water quality in Redwood Creek upstream of the project area. The effect of removing four stream crossings will have a negligible benefit to the water quality and hydrology in the Redwood Creek estuary because of the adverse effects of remaining abandoned roads and numerous unrestored stream crossings upstream, and because the levees will continue to alter the natural hydrologic regime of the estuary.

Prevention of erosion of 630 cubic yards of sediment from removal of the four stream crossings under the selected action will have a minor long-term benefit to the restored stream, a negligible benefit to water quality in the Redwood Creek estuary, and no effect on water quality in Redwood Creek upstream of Strawberry Creek.

Effects on Floodplains—The selected action will allow free passage of bankfull flows (1.5–2 year flows), which is considered the baseline condition for natural streams. Under the selected action, stream flow will be contained within the main channel at low flows, enter the side and dead-end channels at moderate flows, and overtop the planting mounds at very high flows, spreading out onto the floodplain of Strawberry Creek. Currently, all flows spread out into the wetland, which is the former floodplain of both Strawberry Creek and Redwood Creek. At very high flows (greater than a 200-year recurrence interval flood), the floodplain of Strawberry Creek will be subsumed into the floodplain of Redwood Creek as the levees are overtopped.

Although confining low flows within the excavated channel with mounds on either side and moderate flows within the dead-end and side channels rather than allowing the flows to spread over the floodplain is considered to be adverse, this impact is minor because this is the condition of a naturally functioning floodplain. As the riparian plantings shade out the channel to prevent reinvasion of reed canary grass, the long-term effects to the floodplain of Strawberry Creek will be minor and adverse as flows are conveyed within the channels rather than spreading out over the wetland.

However, the impact is acceptable because an excavated channel is needed to create fish habitat; the mounds are needed to inhibit re-growth of reed canary grass to allow riparian vegetation to re-establish; and low flows confined within the main channel, moderate flows moving into the side and dead-end channels to create additional fish habitat, and very high flows overtopping the mounds represent the conditions in a naturally functioning floodplain.

Removal of four stream crossings under the selected action and prevention of 630 cubic yards of sediment from being delivered into the floodplain will have a negligible benefit to the Redwood Creek floodplain in the Orick valley upstream of the project area. Strawberry Creek enters the Redwood Creek floodplain at a point where the floodplain is confined by flood control levees. As watershed restoration projects are completed within and outside the parks, and new logging roads upstream of the parks are constructed and maintained to modern standards, there will be a long-term moderate benefit to the floodplain of Redwood Creek from reducing sediment input that causes aggradation and unnatural widening of the floodplain.

The cumulative long-term effect of the selected action will be a minor benefit to the floodplain of Strawberry Creek from replacing the undersized West Tributary culvert with a culvert sized to accommodate 100-year flows and a minor benefit from restoration of portions of the stream channel. Privately-owned grazing lands outside the park will benefit from reduced flooding as flows are conveyed downstream more effectively. The floodplain outside the restoration areas will continue to be altered from past channelization, and other alterations to support transportation, agricultural, and residential development. The flood control levees in lower Redwood Creek will continue to have a significant effect on the floodplain of Redwood Creek in the lower Orick valley.

Effects on Wetlands—Under the selected action, there will be adverse effects to wetland vegetation from grubbing to remove invasive reed canary grass, other invasive grasses and localized areas of native species including slough sedge and common rush. There will be adverse effects to hydric soils from temporary access roads, excavation to create channels, and placement of fill to create mounds.

Channel excavation will affect about 1.27 acres of palustrine emergent wetlands. Placement of fill will convert about 0.91 acre of 3-parameter palustrine emergent wetlands on the planting mounds

at 22 feet above sea level to 1-parameter palustrine forested wetland which is considered upland under the US Army Corps definition. Approximately 0.37 acres of 3-parameter palustrine emergent wetland will be converted to Waters of the US as a free-flowing stream within the excavated channels. The purpose of the constructed planting mounds is to provide an area above seasonal high wetland water levels to support the growth of Sitka spruce needed to inhibit re-growth of reed canary grass.

The selected action will result in a loss of 1.27 acres of wetlands regulated by the US Army Corps of Engineers as 3-parameter jurisdictional wetlands. Under the Corps' regulations, 0.91 acres of palustrine emergent wetlands will be converted to uplands to create planting mounds and 0.37 acres will be converted to Waters of the US as stream within the channels. The Corps evaluated these effects prior to issuing a Department of the Army Permit No. 2009-0041N on January 3, 2014 to the NPS for the selected action to restore Strawberry Creek. The 0.91 acres are classified as palustrine forested wetlands and the 0.37 acres as riverine wetlands under the Cowardin system used by the NPS for managing wetlands under the *Procedural Manual #77-1: Wetland Protection*. The palustrine forested wetlands will function as a riparian zone along the stream channel. Therefore, there is no net loss of wetlands under the NPS guidelines for protecting wetlands.

Conversion of wetland to Waters of the US in the channels and upland for the mounds (palustrine forested wetland under the Cowardin classification system) is needed to achieve the purpose of the project to restore the stream function of habitat for threatened fish.

There will be a moderate long-term benefit to wetlands under the selected action from removal of invasive species and planting of native riparian species; creating a well-defined, stable channel with abundant large woody debris embedded in the channel; and increasing topographic complexity through creation of channels and addition of side channels and sloping mounds adjacent to the main channel.

The timing, duration, and distribution of wetland water levels, both surface and subsurface will be affected by the project. Any changes to water levels are anticipated to be permanent but the extent of Corps jurisdictional 3-parameter wetlands outside the project area is not expected to change. Water levels and vegetation composition in and around the project area will be monitored for five years to determine effects of the project on adjacent wetlands.

Wetland values of lower Redwood Creek and the Redwood Creek estuary have been significantly altered by upstream land uses, especially logging and associated road construction that has increased sediment input and the flood control levees. Prior to channelization of lower Redwood Creek for flood control and draining, diking, and channelization of tributaries including Strawberry Creek, wetland values of lower Redwood Creek included flood attenuation and habitat for wildlife and fish, including threatened fish species. The levees have assumed the flood attenuation function and reduced other natural wetland functions.

Effects on Vegetation—Under the selected action, the primary impacts to vegetation are the removal of invasive reed canary grass and some native vegetation in the wetland complex; planting sedges, willows, alder, and spruce on the mounds; and removal of about 0.44 acres of vegetation to remove four stream crossings. Removal of invasive plants and planting native species is a moderate long-term benefit to vegetation. Removal of the native species mixed among the non-native plants within the wetland and removal of the 0.44 acres of vegetation for stream crossing removal are negligible adverse effects that are necessary to achieve the purpose of the project. Vegetation affected by removal of the stream crossings are common species

regularly removed for road maintenance throughout the park and the region. Revegetation will occur naturally within a few years from the seed bank in the mulch salvaged from the initial excavation and in the soils around the excavation areas. The selected action will not affect other vegetation in the park or the surrounding area.

Effects on Non-Sensitive Fish and Wildlife—Under the selected action, removal of vegetation in the wetland and excavation to remove stream crossings and realign stream channels will cause direct disturbance to individuals of small relatively sedentary species of wildlife or to fish that occupy the wetland. This will be a significant adverse effect on those individual animals that are displaced or killed. There will be negligible effects on larger more mobile species of wildlife that inhabit the project area and are able to move away from areas of disturbance. The overall adverse effect on non-sensitive fish, amphibians, and wildlife will be negligible because those animals are common in the area, will be able to find refuge in the undisturbed areas adjacent to the project area, or will reoccupy the project area after construction.

After construction is complete, the selected action will benefit wildlife species that inhabit riparian and stream habitats. The benefit will be negligible over the short-term until the riparian plantings are sufficiently established and minor in the project area over the long-term. The overall benefit to park wildlife will be negligible because stream and riparian habitat is common elsewhere in the park. Conversion of 1.27 acres of palustrine emergent wetland to palustrine forested wetland or Waters of the US will have negligible long-term adverse effects on species that occupy the wetlands because about 30 acres of palustrine emergent wetland habitat will remain adjacent to the restoration area.

Effects on Rare, Sensitive, Threatened, and Endangered Species—The restoration activities under the selected action may affect and are likely to adversely affect SONCC coho salmon and NC steelhead, and their designated critical habitat. NMFS anticipates that incidental take of listed species will be in the form of harming or killing of fish during dewatering of streams and fish relocation, and temporary effects of sediment mobilization and modified hydrology during instream construction activities. Multiple fish and habitat protection measures, the reasonable and prudent measures, and the terms and conditions required under the NOAA RC/Corps funding and permitting for restoration activities will minimize the level and effect of take associated with the Strawberry Creek restoration project.

Short-term adverse effects to listed fish from instream construction activities and temporary sediment mobilization will be outweighed by the long-term benefits to the species and their habitats from restoration of stream channels, replacement of the undersized culvert on the West Tributary with a culvert large enough to convey 100-year flow events, and removal of four stream crossings in the upper Strawberry Creek watershed. The duration and magnitude of adverse effects to listed salmonids and designated critical habitat associated with project implementation will be significantly minimized due to the multiple avoidance and minimization measures found in the CDFW restoration manual and the reasonable and prudent measures and the terms and conditions required under the NOAA RC biological opinion.

NMFS determined that the selected action is not likely to jeopardize the continued existence of SONCC coho salmon or NC steelhead, and is not likely to result in the destruction or adverse modification of designated critical habitat for these species. NMFS concluded that the activities will adversely affect EFH for coho salmon, but that the activities will be conducted using adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

There will be no direct adverse effects on northern spotted owls or marbled murrelets under the selected action. There will be indirect adverse effects on northern spotted owls from a slight amount of degradation of potentially suitable owl habitat from removal of 0.44 acres of understory vegetation for stream crossing removal. This adverse effect will persist for no more than five years and is judged to be negligible over the long-term.

Effects on Cultural Resources—The NPS submitted a determination of “No Historic Properties Affected” from the proposed action to the California state historic preservation officer (SHPO) on November 21, 2013, in accordance with 36 CFR 800.5. The SHPO concurred with the NPS determination in a letter dated December 23, 2013 (reference NPS100125A).

The cultural sensitivity of the Strawberry Creek project area is very low because the area has been altered for agricultural activities or logged, which very likely damaged or destroyed any cultural resources originally present. Although cultural resources that may occur in the vicinity of the Strawberry Creek project may be important cultural resources, no known significant cultural resources were found in the Strawberry Creek project area. Therefore, no adverse effects to cultural resources are expected under the selected action.

The selected action will not change the treatment and/or management of archeological resources in Redwood National Park. No significant adverse effects to cultural resources are anticipated from any reasonably foreseeable park actions. Cultural resources throughout the remainder of the Redwood National Park will be unaffected.

Effects on Visitor Experience and Visual Quality—Visitor experience will be slightly improved under the selected action by providing an easily accessible location for education on restoration of watersheds and anadromous salmonid habitat. There will be short-term adverse effects on visual quality associated with construction activities. The selected action will have a minor benefit to visual quality in the project area from creation of a riparian zone along the restored channel. The overall benefit to visual quality in the park adjacent to the project area will be negligible.

Effects on Adjacent Communities—The selected action will have a long-term indirect economic benefit to local communities from improving habitat for anadromous salmonids which will enhance populations of these fish. The economic benefit from increased sport fishing opportunities will be negligible.

Conclusions—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. An NPS watershed restoration geologist, fish biologist, and vegetation manager will provide project oversight and supervision of excavation and instream work, and riparian planting.

Summary of Adverse Effects on Resources and Mitigations

Resource	Effect	Mitigation/Responsible Party
Air Quality	Negligible short term adverse effects from vehicle emissions and dust	Vehicle maintenance emissions regulated to state standards (contractor)
Soils	2,664 cubic yards of soils excavated to create channels, road fill for	multiple minimization measures to reduce erosion including

Resource	Effect	Mitigation/Responsible Party
	culvert replacement, and for stream crossing removal; about 11,830 cubic yards placed to create mounds	standard BMPs, timing of work, and winterization (contractor)
Hydrology & Water Quality	negligible to minor short-term adverse effects on water quality from erosion of newly excavated soils over one to two years	Spill prevention plan (NPS); implement prescribed multiple minimization measures and BMPs to reduce short-term water quality effects adverse effects (contractor)
Floodplains	Low flows confined within new stream channel	Confined flow needed to meet project purpose to restore free-flowing stream suitable for fish habitat
Wetlands	1.27 ac of 3-parameter jurisdictional wetland excavated and converted to 0.37 ac to Waters of the US and 0.91 acres to upland	0.91 acres classified as palustrine forested wetland under Cowardin system (1-parameter); wetland impacts acceptable to meet purpose and need for selected action
Vegetation	0.44 ac affected for stream crossing removal and salvage for use as mulch; 1.27 acres of palustrine emergent vegetation is mixed invasive and native species	Salvage on-site vegetation and apply as mulch to restored landforms at stream crossings (contractor); invasive reed canary grass removed (contractor); native riparian vegetation replanted on 0.91 acres (contractor)
Wildlife	No mitigation prescribed for disturbance to species tolerant of on-going human disturbance	Remove and dispose of all food scraps and trash to avoid attracting scavengers and habituating wildlife to people and human food sources (contractor)
Threatened Species	negligible indirect effect to northern spotted owls from habitat degradation (removal of 0.44 ac vegetation); short-term effects to fish from instream construction and temporary sediment mobilization	Implement BMPs and minimization measures specified in NOAA RC biological opinion, CDFW FRGP (contractor); owl habitat will recover in 5 years

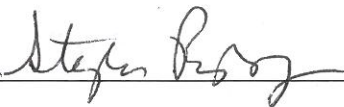
Basis for Decision

Based on the environmental assessment, analyses of issues and alternatives, together with consideration of minimal public interest expressed and the relation between public interest and laws, statutes, and regulations for managing National Park Service units, the ability of the mitigation measures to reduce or eliminate adverse impacts, and the concurrence of agencies that fund and regulate similar projects for restoration of salmonid habitat in California, the NPS will

implement as its selected action the project described as Alternative 2 in the Strawberry Creek Restoration Environmental Assessment dated February 2014.

It is the determination of the National Park Service that the selected action to restore a portion of Strawberry Creek as habitat for threatened fish species and reduce potential for soil erosion through upslope watershed restoration 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. The selected action will further the goals for watershed restoration and management of threatened and endangered species described in the 1999 GMP/FEIS and 2000 Record of Decision. 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 project as soon as practicable.

Recommended:



4-10-14

Stephen Prokop
Superintendent
Redwood National Park

Date

Approved:



4/16/14

Christine Lehnertz
Regional Director
Pacific West Region

Date