

**A Biological Assessment of Impacts
To Aquatic Threatened Species
From The Redwood National Park
Routine Road Maintenance Program**

April 2015

I. INTRODUCTION

The purpose of this biological assessment (BA) is to review the continuation of the National Park Service (NPS) action, Routine Road Maintenance Program in Redwood National Park (RNP or “park”), in sufficient detail to determine if the proposed action may affect any aquatic threatened or endangered species and/or their critical habitats. This BA is prepared in accordance with legal requirements set forth under section 7 of the Endangered Species Act (19 U.S.C. 1536 (c), 50 CFR 402), and meets the criteria for informal consultation with the National Marine Fisheries Service (NMFS). This document also meets the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et. seq) essential fishery habitat (EFH) consultation requirements (sec. 305 (b)(2) and 305 (b)(4)(B)) and ESA/EFH parallel consultation guidelines established by NOAA Fisheries (USDC 1999c, USDC 2001) for an informal consultation.

Note that this is a renewal of the previous, continuing, but altered action consulted upon in 2008, Annual Routine and Non-Routine Road Maintenance Program in Redwood National and State Parks (NMFS biological opinion ref. file #: 151422SWR2005AR00575).

The work described in this assessment is planned to occur between 2015 and 2025.

Project Area

This renewal only covers NPS actions in the Redwood National and State Parks (RNSP) partnership. The NPS conducts road maintenance on national park roads in RNP and on two California Department of Parks and Recreation (CDPR) owned roads – the Newton B. Drury Scenic Parkway in Humboldt County and the Mill Creek Campground Access Road in Del Norte County. All the roads maintained by the NPS except for the Mill Creek Campground Access Road are scattered throughout the Redwood Creek watershed. The Mill Creek Campground Access Road is located in the Smith River watershed. The actions to take place on the Mill Creek Access Road will have no effect to listed species and so will not be discussed further. CDPR also conducts road maintenance within RNSP, but only on non-federal CDPR - owned roads using only non-federal funds. CDPR actions will not be considered in this assessment. Roads maintained by RNP are shown in Appendix I.

II. CONSULTATION TO DATE

RNSP currently has three species of anadromous fish that could be affected by the proposed action that are listed as threatened under the Endangered Species Act:

1. California Coastal (CC) Chinook Salmon (*Oncorhynchus tshawytscha*)
2. Northern California (NC) Steelhead (*Oncorhynchus mykiss*)

3. Southern Oregon/Northern California Coasts (SONCC) Coho Salmon (*Oncorhynchus kisutch*)

Critical habitat has been designated for all three species.

Two other anadromous fish species, green sturgeon (*Acipenser medirostris*) and southern eulachon (*Thaleichthys pacificus*), are also listed as threatened and potentially occurring in Redwood National and State Parks. Green sturgeon are only found in the marine portions of RNSP, outside the area potentially affected by the proposed program. Southern eulachon historically occupied only the very lowest reaches of the Smith River outside of RNSP, the very lowest reaches of the Klamath River and the very lowest reaches of Redwood Creek during the winter and spring where and when the proposed program actions will have no effect. Neither of these species has any potential to be affected by the proposed program and will not be mentioned further in this document.

The Routine Road Maintenance Program renewal was discussed during meetings on August 18, 2014 and October 1, 2014 between Leslie Wolff (NMFS) and Keith Bensen (NPS) and during a field meeting on January 15, 2015 as well as in email correspondence in February and March 2015 between Keith Bensen and Catherine McGourty (NMFS).

III. CURRENT MANAGEMENT DIRECTION

Please refer to *Threatened, Endangered, Proposed, and Candidate Species in Redwood National and State Parks, Biological Assessment Reference Document* (RNSP 2013) for a detailed summary of laws and policies that influence management direction in RNSP.

Roads

The 1999 RNSP General Management Plan/General Plan/Final Environmental Impact Statement/Report (USDI and CDPR 1999) requires the parks to “....work with federal, state, and county agencies to ensure that environmentally sensitive maintenance operations were used on portions of the...roads that pass through the parks” (p. 43), and “...maintain RNSP roads that provide access...to RNSP facilities so that they are sustainable, [and] provide safe access for visitors and employees....” (p. 70).

IV. DESCRIPTION OF THE PROPOSED ACTION

PLEASE NOTE - A list of best management practices and minimization measures is located at the end of this section.

Frequency and Timing of Proposed Activities

Roads maintained by the NPS in RNSP are prioritized for maintenance funding, and thus maintenance intensity, according to a list of criteria described in the Asset Priority Index Scoring Workshop Guidance – Park Facility Management Division (NPS 2012). The criteria weigh the roads' use in contributing to natural resource preservation, cultural resource preservation, visitor use, park operations, or "uniqueness" (e.g. identified in the park's legislation as a significant resource or critical to visitor use enjoyment). Generally, roads with the highest public use receive the highest maintenance funding priority; roads only regularly used by park staff receive lower funding priority; and roads not used by the public and rarely or never by park staff and therefore slated for removal receive the lowest maintenance funding priority (Appendix II). Roads are maintained to the extent practicable depending on funding levels, which varies from year to year.

All ground disturbing actions will occur between 1 June and 15 October. If a limited number of actions can be implemented after October 15, then the NPS may proceed, in coordination with NMFS, as long as work is not initiated if precipitation is anticipated within 48 hours or where saturated ground conditions exist. The NPS will have all erosion control materials necessary to winterize each work site within 24 hours for all work occurring after October 14. The NPS will monitor weather forecasts daily after October 14 to determine when wet weather conditions are likely and when to cease operations for the year.

Types of Proposed Activities

Regardless of funding priority, and thus maintenance intensity, all roads are maintained using the same methods. The proposed work can be divided into two categories of routine maintenance for roads: 1) annual and/or periodic maintenance of the road surface, the cut bank, and the fill slope, and 2) one time stream crossing culvert replacement or upgrading to reduce erosion potential on roads. Annual and periodic road maintenance and stream crossing culvert replacement are preventive measures to help reduce erosion along roads and to provide safe vehicular access to park areas for the public and park staff.

1) Annual and Periodic Maintenance

1. Blading – consists of surface blading native or aggregate roadbeds to smooth travel ways and provide proper drainage. Blading includes shaping the crown or slope of the traveled way, berms, and drainage dips. Excess roadbed width is shaped only as needed to provide drainage away from the traveled way. The work generally is accomplished by a motor grader. Side casting is sometimes unavoidable when cleaning inboard ditches. No side casting is done near stream channels. When approaching a stream crossing, the operator

pulls the material on to the road surface and uses a loader to move the materials offsite. RNP will eventually eliminate inboard ditches anywhere possible, which will reduce or eliminate the need to side cast. The procedure for blading the actual road surface is different; the operator works the surface material back and forth, retaining as much as possible.

2. Spot surfacing – consists of placing surface aggregate as needed. It includes preparing the area, and furnishing, hauling, and placing all necessary materials to blend with the adjacent road cross-section. It is usually done with a dump truck, motor grader, and a small roller.
3. Asphalt pavement patching – consists of patching potholes, skin patching of asphalt surfaces, and patching asphalt berms. The work is typically done using a grader, dump truck, small paver, and small roller. A backhoe is used if the damaged area requires digging out. The NPS maintains approximately 17 miles of paved road (Appendix I). Occasional pothole patching is done on an annual basis, but there is no runoff of petroleum based products during this procedure. Asphalt overlay projects will occur at an unknown, small number of locations over the life of this consultation. The procedure does require tack oil to bond the existing pavement with the new pavement. These projects are only performed during the dry season. The equipment utilized by contractors allows for the oil to only be applied on the existing surface.
4. Maintenance of unpaved shoulders – consists of reshaping unpaved shoulders adjacent to a paved traveled way to their original configuration. This work is done with a motor grader with attachments. As with road surface blading, no material is pushed into any stream channels.
5. Ditch maintenance – consists of removing rock, wood, soil, and other materials and re-shaping all types of drainage ditches to provide an unobstructed waterway. During the operation, low growing vegetative cover is retained over the ditches. Work is done with a motor grader and/or backhoe.
6. Remove and haul material/slump filling – consists of loading and hauling slide debris or excess material (such as rock, soil, and vegetation) to designated disposal sites such as old landings using a wheeled loader and dump truck. If material is used to fill slumps in the road it is compacted. Equipment used to fill slumps includes wheeled loaders, dump trucks, compactors, motor graders, and backhoes.
7. Drainage structure maintenance – consists of cleaning and reconditioning culverts and other drainage structures such as catch basins, inlet and outlet channels, and ditch line transition areas. Usually accomplished by hand, or in extreme cases, with a backhoe and hauled off to a designated area away from stream courses. Work does not include cleaning totally plugged culverts or replacing all or part of the drainage structure.

8. Roadway drainage maintenance – consists of improving drainage on roads that have been physically closed to traffic. At completion of drainage work the road is not passable to vehicles.
9. Drainage dip maintenance – consists of maintenance of existing drainage dips, including rolling dips on native, aggregate, and paved roads, and maintenance of special outlet structures to provide for a smooth flow of water from the travel way. This work is done with a motor grader with attachments. Note: dips are designed to function only when a culvert plugs or is overtopped.
10. Vegetation establishment – consists of applying seed mulch, and planting roadways and disposal areas that have been disturbed by maintenance activities. This work would usually be accomplished by hand. No fertilizers are used.
11. Cutting roadway vegetation – consists of cutting all vegetation, including hazard trees, less than 12” in diameter at six inches above the ground in order to improve sight distance and provide overhead clearance. With approximately 180 miles of roadside vegetation to maintain this procedure is done on a year-around basis. This work would be performed by hand using chainsaws or with a mechanical brush cutter. The objective is to manage roadside vegetation over time to maintain slope stability through vegetation cover while providing for sight distance and drainage needs. All of the work occurs within the road prism.
12. Windstorm Clearance – consists of removing down trees from roadway surfaces. This work is intended to open roads closed by minor windstorm debris or other natural occurrences. The woody debris is collected for park use or put back into the forest. The debris is not put into any stream channels.
13. Maintenance of cattle guards – consists of cleaning and restoring cattle guards and appurtenances. Work would normally be accomplished by hand, although heavy equipment may be used to raise the deck grid.
14. Sign Maintenance – This work consists of cleaning, replacing, and reconditioning signs, posts and markers; all work is done by hand.
15. Paved surface cleaning – consists of removing loose material from a paved roadway, including bridge decks and paved shoulders. Use of hydraulic flushing will not be permitted within a horizontal distance of 200 feet of a flowing stream, unless approved by the RNP Fish and Wildlife Branch of Redwood National Park. Other cleaning will be accomplished using power broom or blowers, truck with rock blade, and grader. **Note-** Hydraulic Flushing has not been used over the past ten years but the park would like to reserve the ability to use the technique if needed to unplug culverts.

2) One Time Culvert Replacement/Upgrading

PLEASE NOTE – No culverts that cross streams along anadromous reaches will be replaced under this maintenance program. All culverts that may be replaced under this program are located in upper portions of watersheds above any anadromous reaches.

Culvert replacement/upgrading, if needed, will occur as funding and staffing allow. **A maximum of ten separate stream crossing culvert replacement/upgrades could be completed over the next decade.** Only one culvert replacement/upgrade will occur in any one sub-watershed (first order) over the next decade.

Each stream crossing on all roads not currently scheduled for removal will be evaluated for erosion control needs and treated as appropriate to reduce future erosion. The options include replacing or repairing culverts, installing arch culverts, installing additional culverts, constructing rolling dips and removing completely.

Work will include the removal of existing undersized, leaking or worn out culverts. Culverts will be replaced and additional culverts will be installed where needed and none now exist. Old culverts and any buried woody debris will be removed, exposing the original channel bed. The size of the excavation will vary depending on the size of the culvert and the amount of woody debris found in the fill. The sizing of a new culvert will be based on hydrologic modeling of the watershed, stream size, stream gradient (see Figure 1) and estimated 100 year cubic foot/second stream flow. A new culvert would be set below stream grade to allow stream bed material settle out in the culvert bottom. The new culvert will be installed to maintain a uniform flow line from inlet to outlet channel. The backfill will be compacted around the pipe using vibratory compaction equipment. Additional fill may need to be added to bring the road up to grade. Where appropriate, a rolling dip may be incorporated into the reconstruction of the crossing. Backhoes, excavators, bulldozers, loaders, dump trucks and compaction equipment will be used.

Rolling dips are large, gently sloped water bars constructed at or just down slope (along the road) from stream crossings. In the event of drainage structure failure, the rolling dip directs the stream flow across the road and back into its natural flow course. Rolling dips are installed to prevent mass wasting where there is a risk of culverts and Humboldt crossings plugging up on non-public roads.

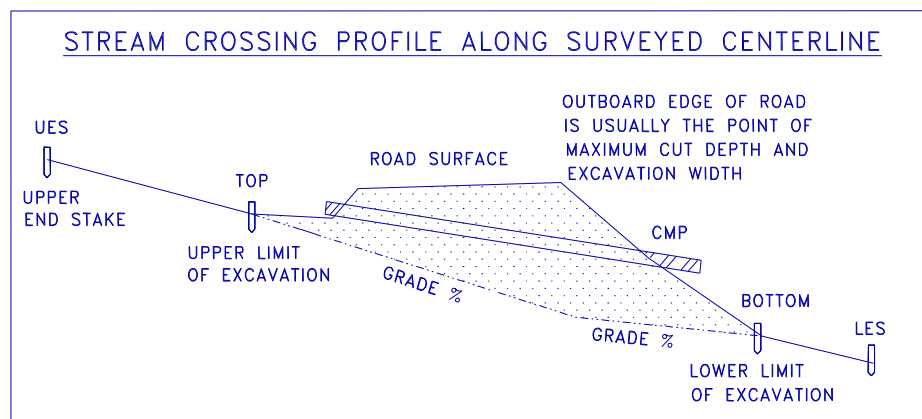
Methods for Replacing and Upgrading Culverts

Stream crossing excavations to replace and/or upgrade culverts (see Figure 1) involve the removal and disposal of road (crossing) fill, culverts, and organic debris from a stream channel.

If the crossing has water flowing, it will be diverted around the worksite. Small trees and vegetation are removed from the work area and stockpiled. Fill is removed by an excavator and either hauled by truck or pushed by a dozer to a site where the woody debris can be separated. All logs or Humboldt crossings are removed and every attempt is made to install the new pipe on the original stream channel. The new culvert, sized to meet a 100-year event, is then installed with a flared inlet. The outlet is placed beyond the fill site. Rock riprap is placed at the outlet to dissipate water and prevent erosion during heavy flows. Material from the site that is reusable is then compacted around the culvert. If there is not a sufficient amount of reusable material, clean $\frac{3}{4}$ inch minus gravel is purchased and hauled to the site. The material is compacted in one-foot increments. After the compaction is complete, the site is mulched with rice straw and vegetation that has been stockpiled. The same process would take place for a “culvert upgrade”. During a culvert replacement, any banks upstream of the inlet which pose a threat of collapsing and depositing sediment, will be excavated to a 2:1 slope.

Any large woody debris uncovered during excavation will be placed near the restored channel area to provide both sediment control and habitat complexity.

Figure 1. Stream crossing profile.



Newly placed culverts may experience minor adjustments, mostly during the first winter following excavation and placement. The remaining road fill, wedged in the interstices of the original stream bed, may be mobilized; small portions of channel side banks may settle or slide; the original channel bed armor may adjust in response to the logging slash up and downstream of the excavation site; decaying logging slash or natural organic debris may collapse, causing a small chain reaction up and downstream.

Best Management Practices and Project Design Criteria to Minimize Impacts to Threatened Salmonid Species

Applicable to All Actions

1. All non-emergency project work will be completed during the “normal operating season” (NOS), that is, between June 1 and October 15 of each year. If more than 0.5 inches of rain is forecast during the dry season, project operations will temporarily cease and sites will be winterized. If periods of dry weather are predicted outside of the NOS, additional small work items may be done, if they can be completed within the window of predicted dry weather. Only those repairs needed to reduce risks from active erosion will be undertaken outside of the NOS, in coordination with NMFS.
2. Equipment, both hand tools and heavy equipment, will be inspected daily to check for leaks. Equipment that may leak lubricants or fuels into a drainage will not be used until leaks are repaired. All equipment will be stored, serviced and fueled at least 200 feet from stream crossings. Heavy equipment will be cleaned (e.g., power washed, steam cleaned) prior to use below the ordinary high water mark. A spill plan and materials for spill containment will be available to onsite personnel and all personnel shall know how to use them. In the event of a spill, work shall be stopped immediately, clean-up will begin and the appropriate authorities will be notified. All vehicles and equipment entering the project area would be free of oil leaks. Any oil leaks occurring after equipment entry at the site would be repaired immediately upon discovery and no leaking equipment would be used. Approved absorbent materials would be kept on site in the event of a spill. Equipment would be cleaned and repaired (other than emergency repairs) at an established maintenance facility. All contaminated water, sludge, or other hazardous compounds would be disposed of at a lawfully permitted or authorized location. All fuel and lubricating material containers would be located in stable, secure locations.
3. Disruption of natural hydrologic flow paths, including diversion of stream flow and interception of surface and subsurface flows, will be minimized.
4. Adequate erosion control supplies (gravel, straw bales, shovels, etc.) will be kept at all construction sites and during all maintenance activities to ensure materials are kept out of water bodies.
5. Sediment delivery to streams from roads will be minimized. Out sloping of the roadway surface is preferred, except in cases where out sloping would increase sediment delivery to streams or where out sloping is unfeasible or unsafe. Road drainage will be routed away from potentially unstable channels, fills, and hill slopes. Side casting will be restricted as necessary to prevent the introduction of sediment into streams.

6. Vegetation trimming conducted in riparian areas will not remove downed woody material except to the extent necessary to provide for safe road use and conifers exceeding twelve inches in diameter be retained unless the tree is a direct impediment to safe road use. If a conifer exceeding twelve inches diameter must be cut, it may not be moved from the riparian area or stream corridor without review from a park biologist.

Annual and Periodic Road Maintenance

1. Diesel has been eliminated as a releasing or cleaning agent and environmentally sensitive cleaning and releasing agents will be used during surface work.
2. Water drafting will be conducted only at sites approved by a park biologist. Operations are restricted to one hour after sunrise to one hour before sunset. Streams and pools will be used where water is deep and flowing, as opposed to streams with low flow and small isolated pools. Vehicle approaches will be inspected by a park biologist or designee to ensure damage to riparian areas is minimized.
3. Each pumping operation will use a fish screen. The screen face will be oriented parallel to flow for best screening performance. The screen will be designed and used so that it can be submerged with at least one-screen-height-clearance above and below the screen. Pumping rate will not exceed 350 gallons per minute and will not exceed 10 percent of the stream flow. Operators will keep a logbook on the truck containing the following information: Operators Name, Date, Time, Pump Rate, Filling Time, Screen Cleaned (Y or N), Screen Condition, and Comments. These guidelines will be included as instructions in a logbook with serially numbered pages.
4. Material removed from a ditch will be disposed of outside of any waterway or wetland. Erosion control devices such as check dams, silt fences, and other acceptable techniques, will be used when the potential exists to have sediment or other materials entering water bodies. Drainage ditches and steep slopes shall be reseeded with native plants.
5. Chip Seal (Asphalt Emulsion) will not be applied in a manner that will create runoff or product delivery into streams. Chip Seal will not be applied during rain and requires a clear 2 day forecast following the projected completion of application. Treated surfaces will not be washed.

One Time Culvert Replacement/Upgrading

PLEASE NOTE – No culverts that cross streams along anadromous reaches will be replaced under this maintenance program. All culverts that may be replaced under this program are located in upper portions of watersheds above any anadromous reaches.

1. Any disturbed ground must receive appropriate erosion control treatment (mulching, seeding, planting, etc.) prior to the beginning of the wet season. Operations will use all feasible techniques to prevent any sediment from entering a drainage system.
2. Fine sediment cleaned out from the inside of culverts will be removed to an upland location, where it cannot enter stream networks or road drainages that are hydrologically connected to a stream, and stabilized.
3. For each stream crossing replacement, and rolling dip installation, disturbance to riparian areas will be minimized. Materials used for culvert replacements, or creating rolling dips must minimize the possibility of introduction of fine sediment or toxins into the drainage system.
4. New culverts, and other stream crossings will be constructed to accommodate at least the 100-year flood, including associated bed load and debris. Priority for upgrading will be based on the potential impact and ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of stream flow out of the channel and down the road in event of a crossing failure.
5. Stream flow, on all live streams, must be diverted around culvert construction sites. The diverted flows will be returned to their natural stream course as soon as construction is complete and prior to the rainy season. Any wastewater from project activities and de-watering is disposed of off-site in a location that will not drain directly into a stream channel or carry sediment laden water into a stream channel. Installation of hay bales and silt fences will be completed before flow is restored to its natural stream channel. All disturbed areas will be winterized as well as stabilized prior to the rainy season and as needed and will be restored to pre-work conditions.
6. Effective erosion control measures will be in place at all times during construction activities. Construction within the 5-year floodplain does not begin until all temporary erosion controls (e.g., straw bales, silt fences that are effectively keyed in) are in place, downslope of project activities within the riparian area. Erosion control structures will be maintained throughout, and possibly after, construction activities. Sediment will be removed from sediment controls once it has reached on-third of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 12 cm. Catch basins will be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.
7. Culvert and dip construction will take place from the bank, if possible, or on a temporary, removable pad underlain with filter fabric.

V. STATUS AND DISTRIBUTION OF LISTED SPECIES

1. Southern Oregon/ Northern California Coast Coho Salmon

A. *Abundance and Distribution*

The anadromous fish populations of Redwood Creek have experienced a substantial reduction, in part due to severe flood events that moved large amounts of sediment from highly eroded hillslopes to the stream channels of the Redwood Creek basin (Madej *et al.* 2006). News accounts and recollections of longtime residents of the Redwood Creek watershed suggest that both the size and numbers of salmonids have declined in recent decades (Van Kirk 1994). Within the last decade no juvenile coho have been observed in the main channel above river km 20 and juvenile coho were restricted to 9 side-pocket cold pool locations in the lower 20 km of the channel (Ozaki and Anderson 2005). Madej *et al.* (2006) stated that < 20% of the main Redwood Creek channel currently supports young coho during summer. In 2009, no 0+ or 1+ juvenile salmon were captured in the upper Redwood Creek down migration trap and both of these age classes' capture rates have showed steady declines between 2003 and 2009 with the 0+ age class exhibiting a particularly severe decline (Sparkman 2010). In 2010 at the lower Redwood Creek trap, only six 0+ and thirteen 1+ coho juveniles were captured (Sparkman 2011). The vast majority of coho juveniles are coming from the Prairie Creek subwatershed. In Prairie Creek, Duffy (2011) estimated escapement of adult coho ranged from a high of 680 in 2002 to 28 in 2010.

B. *Habitat Status*

Currently occupied suitable coho habitat occurs in the lower 12 mi (20 km) of the mainstem of Redwood Creek and its low gradient tributaries, including the first 13 mi (21 km) of Prairie Creek. Suitable habitat in Redwood Creek also exists in the approximately 15 mi (25 km) upper most reach of Redwood Creek, however, coho no longer occur from here down to the lower reach below the Tall Trees Grove. Surface water and daily minimum temperatures in summer from Tall Trees upstream to the O'Kane Bridge on Hwy 299 tend to be above the desired range for juvenile coho (i.e., < 18°C [64°F]) (Madej *et al.* 2006). These conditions are likely the result of intensive logging in the basin that began after 1950. Floods in the 1950s, 60s, and 70s, and in 1997 caused wide-spread road and stream-crossing failure that increased streambed aggradation and bank erosion. Also, the riparian vegetation changed from conifer-dominated to red alder-dominated, allowing for increased sunlight and an increase in stream temperatures (Madej *et al.* 2006). Non-natal coho habitat below Prairie Creek is restricted to the only two tributaries entering the estuary. Both, Sand Cache Creek and Strawberry Creek are low gradient but degraded due to land use activities and effects of the levee configuration; Sand Cache is generally isolated from the estuary embayment, but coho have been found in Strawberry Creek.

2. Northern California Steelhead (*Oncorhynchus mykiss*), Threatened

A. *Abundance and Distribution*

Steelhead are found in most low order, high and low gradient tributaries to Redwood Creek.

They are able to leap above barriers that might impede coho salmon (D. Anderson pers. comm.). Whether logjams are barriers to fish movement depends upon stream dynamics such as the logjam size and height, pool depth immediately below, and the stream discharge as well as the timing and duration of the steelhead migration. These events change from year to year.

Redwood Creek summer steelhead snorkel surveys began in 1981 between Lacks Creek and Tom McDonald Creek, a 25.7 km (16 mi) index reach, and were expanded to 38.6 km (24 mi) in 1992. Survey data indicate a steady decline since that time, although numbers were low to begin with when the surveys began. In recent years the numbers have leveled off at approximately 10-20 adult fish observed annually (D. Anderson pers. comm.). Forty-four was the highest total number of adult fish observed (in 1984 and 1985); zero fish were observed in 1989 and 2001. In other years the count ranged from 1 to 19 (1991 through 2010). Including surveys upstream of the 38.6 km reach conducted from 1993 to 1998, covering between river km 53 and 85 (river mi 33 and 53) of the 109 km (67.7 mi) long Redwood Creek, the highest numbers of adult summer steelhead observed were 36 in 1994 and 37 in 1997.

Snorkel surveys for summer steelhead have not been conducted in tributaries of Redwood Creek in RNP; the smaller streams do not have large enough pools to support fish during the warm summer months. In addition, adult summer steelhead have not been encountered in these streams during other survey and monitoring activities.

In Redwood Creek winter-run steelhead numbers are higher than summer steelhead numbers. Juvenile winter-run steelhead are the most common and widely distributed fish in the Redwood Creek basin. During sampling efforts in the summers of 1980 and 1981, steelhead occurred in 57 of the 111 Redwood Creek tributaries surveyed (Anderson 1988, Brown 1988). Sparkman's (2010) upper basin down migrant rotary trap catches for the 9 years between 2000-2008 averaged 81,179 0+ steelhead, 9,212 1+ steelhead, and 866 2+ steelhead. There were declines in all of these age classes in 2009, and significant declines in 0+ and 2+ age classes for reasons not easily explained. Results for the lower Redwood Creek trap show a similar negative decline for 1+ and 2+ juvenile steelhead; the decline was significant for 2+ age class (Sparkman 2011). Sparkman (2010) hypothesized that over-summer conditions (e.g., lethally high water temperatures) could be limiting the production of older (2+) age classes in upper Redwood Creek. He cites numerous studies from other areas that indicate a positive linear relationship between out-migrating 2+ smolts and returning adult steelhead (percent returning in the cited studies were between 84 and 98%), and that this age class is the best class for assessing steelhead status, trends, and abundance when information on adult steelhead is not available. In addition, he states "[t]he 2+ steelhead trout are also an excellent indicator of watershed and stream conditions because they spend the longest amount of time in freshwater habitat."

Duffy (2011) estimated escapement in Prairie Creek between 1999 and 2010 to be 4-142 adults; the wide range was influenced by uncertainty in run timing in the earlier years and precipitation in all years. In 2005 a weir was installed in Prairie Creek that revealed a migration of steelhead beginning in late February through mid-April. Numbers of estimated adults in 2005 through 2008 were 70-142 fish (Duffy 2011). Downstream migrant traps in Prairie Creek caught between 505 (2001) and 8 (2004) juvenile steelhead (Duffy 2011). When unidentified 0+ and 1+ trout (which could include juvenile coastal cutthroat trout) are added, the numbers ranged between

201 in 2008 and 4,745 in 2003.

All ages of juvenile steelhead rear in the Redwood Creek estuary during the summer and fall. Population estimates show a seasonal decline in numbers, to a mean of 3,300 (range 540 to 9,350) in the fall (1997 through 2007) before the estuary opens to the ocean. The numbers indicate a lowered carrying capacity of the estuary in the fall.

B. Habitat Status

The Redwood Creek watershed is listed as impaired for high water temperatures and sediment under Section 303(d) of the Clean Water Act. As an example, data from a temperature logger (Tidbit) located on mainstem Redwood Creek upstream of Tom McDonald Creek/Tall Trees Grove for July and August 2009 had maximum and minimum water temperatures of 22.6° C (72.7° F) and 16.2° C (61.2° F), respectively. Maximum diurnal range was 4.9° C (40.8° F). The average water temperature was 19.4° C (66.9° F). Maximum weekly average temperature (MWAT) was 20.6° C (69.0° F). Hours of temperature of 18° C (64.4° F) and above were 1,193 hrs (RNP unpub. data).

Lower Redwood Creek, closer to the ocean, has lower temperatures relative to upstream, but it is still warm. 2009 data for a logger located in lower Redwood Creek upstream of the Redwood Creek trailhead for July and August 2009 had maximum and minimum water temperatures of 22.1° C (71.8° F) and 15.1° C (59.2° F), respectively. Maximum diurnal range was 6.7° C (44.1° F). The average water temperature was 17.7° C (63.9° F). MWAT was 18.3° C (64.9° F). Hours of temperature of 18° C (64.4° F) and above were 492 hrs (RNSP unpub. data).

These recent data indicate that water temperatures in mainstem Redwood Creek are high for salmonid fish, above the preferred temperature range for steelhead of 7.3° C (45.1° F) to 14.6° C (58.3° F), reported by Reiser and Bjornn (1979).

Tributaries to Redwood Creek have lower water temperature. Water temperatures of 63 east and westside tributaries entering Redwood Creek measured during a late July/early August summer steelhead survey in 2005 ranged from 12° C (53.6° F) to 17° C (62.6° F) (Anderson 2005). Water temperatures of all tributaries were cooler than the corresponding temperature of mainstem Redwood Creek measured at the same time. Westside tributaries were generally cooler than eastside tributaries. The mean water temperature of westside tributaries was 14.3° C (57.7° F) (n = 43) and the mean water temperature of eastside tributaries was 15.3° C (59.5° F) (n = 20). The 2005 year tributary water temperatures are similar to temperatures and patterns that have been recorded in other summer steelhead surveys. Where these tributaries enter Redwood Creek there may be deeper, colder pools that may sustain steelhead, although these pools are relatively few (D. Anderson pers. comm.).

3. California Coastal Chinook Salmon (*Oncorhynchus tshawytscha*), Threatened

A. Abundance and Distribution

Winter-run Chinook constitute the main Chinook run in RNSP streams. Adult fish return to spawn after 3 to 6 or more years in the ocean, although 2-year-old male spawners (“jacks”) are commonly observed (Myers *et al.* 1998). These fish begin their upstream migration into the park around November, if access through the Redwood Creek estuary is possible. Entry into Redwood Creek is dependent on the mouth being open to the ocean. The sand bar that blocks the mouth usually breaks open as a result of winter rain events increasing stream flow that fills the estuary and breaches the sand bar. Chinook have spawned and died by the end of January. Spring-run Chinook are not typically considered to use the Redwood Creek watershed. Adult spring-run Chinook have been observed in mainstem Redwood Creek once (6 in the summer of 1988) in the 31 years since 1981 when the park began summer steelhead (*O. mykiss*) snorkel surveys (RNP unpub.data).

In upper Redwood Creek, almost all of the juvenile Chinook migrants are 0+ fry or fingerlings; only 0.01% (92 fish) of the juveniles captured in 10 years of downstream migration study consisted of 1+ juveniles (Sparkman 2010). The estimated population of 0+ juveniles has varied over 10 years of trapping (Sparkman 2010); production was greater than 350,000 individuals in the first 3 years, less than 1,000 in the fourth year (cohort failure) and in the fifth year there was a peak of 630,000 juvenile fish. The 9-year average (2000-2008) for the study was 244,894. A 10-year trend in population abundance over time (2000-2009) showed a significant negative decline (Sparkman 2010). This decline could have been the result of flood flows; studies cited in Sparkman (2010) indicated that scour of redds by high stream flows or floods can cause severe decreases in the production of juvenile salmonids. One study indicated a mortality estimate of 90% due to redd scour. Three of 10 years of study in upper Redwood Creek documented flows capable of scouring spawning redds, which was deemed a likely explanation for the poor production of cohorts in each of the following spring seasons. High, potentially damaging stream flows in upper Redwood Creek are not uncommon, estimated to occur on average every 3.1 years (Redwood National Park unpub. data).

Salmonid surveys in Redwood Creek and its tributaries (e.g., Prairie Creek) show juvenile Chinook do not spend time rearing in upstream areas (Anderson and Brown 1982), but instead, utilize the Redwood Creek estuary. In spring, Chinook fry migrate downstream to rear in the estuary before and after the mouth closes. After the mouth closes, Chinook entry into the ocean is in the fall when the mouth opens. Thus, the Redwood Creek estuary is important as the sole rearing habitat for these ‘ocean-type’ juveniles. Research shows that if given the opportunity the juveniles will spend an extended period (to late summer) in the estuary before entering the ocean. Based on scales of returning adult Chinook spawners it was determined that there may be a survival advantage favorable to the fish that remain in the estuary and grow to a larger size before entering the ocean (Reimers 1973). Redwood Creek estuary Chinook juvenile population estimates for 1997 through 2007 show a seasonal decline in numbers. The September mean estimate was 2,260 Chinook, the minimum and maximum numbers 50 and 6,660, respectively (RNP unpub. data). The limited carrying capacity of the estuary cannot accommodate the Chinook juvenile production occurring in the watershed. However, this extended estuary rearing

affords size increases to 100 mm forklength of those fish surviving in the Redwood Creek estuary in the fall.

In Prairie Creek, the escapement of adult Chinook ranged from a high of 710 in 2002 to a low of 38 in 2008 for 1999 through 2011. Escapement of Chinook has been relatively low in this tributary since 2005. Juvenile fish abundance in the downstream migrant trap varied considerably among years. Chinook fry were very abundant during 1999-2004 but decreased after that (Duffy 2011).

The low numbers of returning adult Chinook are probably related in part to the conditions in the Redwood Creek estuary (D. Anderson pers. comm.). Chinook spawning in the RNSP tributaries may be impeded by stream barriers, but they may be able to surmount some barriers depending on flow conditions when the fish are present.

B. Habitat Status

Chinook estuary rearing habitat was degraded when flood control levees that bisected and altered the historical configuration of the Redwood Creek estuary were constructed in 1968. The levees altered the physical and biological functions of the estuary and adjacent wetlands and confined the lower 3.4 mi (5.5 km) of Redwood Creek stream channel to a width of 300 ft (91 m). The flood control project reduced the amount of riparian vegetation and tree cover, reduced adjacent wetlands, altered valley drainage patterns, decreased the amount of instream woody debris, and caused decreased pool depths along lower Redwood Creek. The levees bypassed and isolated the last downstream meander of Redwood Creek (now called the South Slough), reduced circulation into the North and South Sloughs, and contributed to 50% of the lower estuary between 0 and 4 ft Mean Sea Level filling with sediment or becoming isolated from the embayment (Ricks 1983). Adjacent land uses, e.g., cattle grazing on the flood plain and uncontrolled breaching of the sand berm (which forms a seasonal barrier to the ocean across the mouth), also have contributed to habitat degradation of the estuary.

The Redwood Creek watershed is listed as impaired for high water temperatures and sediment under Section 303(d) of the Clean Water Act. An example of Chinook rearing temperatures, July/August 2009 data from a temperature logger (Tidbit) located at the ends of the levees in the embayment of the Redwood Creek estuary, show the average temperature as 15.1° C (59.2° F) and minimum and maximum temperatures as 21.3° C (70.3° F) and 11.5° C (52.7° F), respectively. Maximum weekly average temperature (MWAT) was 20.2° C (68.4° F). Hours of temperature of 18° C (64.4° F) and above were 227 hrs. Some periods in the estuary are above the optimum rearing temperatures for Chinook.

VI. IMPACTS TO THREATENED AND ENDANGERED SPECIES

Chinook Salmon, Coho Salmon, and Steelhead

Many of the road maintenance program activities described in this document would not affect the

three species of listed salmonids. Vegetation trimming and windstorm debris clearing with hand tools, the most commonly performed road maintenance activity, will not mobilize any sediment into creeks and wet areas. Most road areas where vegetation trimming will take place are in locations away from streams and thus will have no effect to stream shading. In riparian areas near road corridors, vegetation trimming will only be along the roadway itself, resulting in no changes to stream shading function. Sign and cattle guard maintenance as well as vegetation establishment have no potential to affect listed salmonids. Asphalt patching is also expected to have no effect because all work will occur during the normal operating period when no precipitation is expected. All asphalt material will be fully cured before any precipitation falls, thus preventing any pollutants from entering any stream course.

Most ditch and drainage structure cleaning will have no effect to listed salmonids as well. The vast majority of drainage ditches and ditch relief culverts empty into mid slope, non-stream areas where any negligible amounts of mobilized sediment will be captured by terrestrial vegetation and woody debris. For those ditches and ditch relief culverts that do drain directly into a watercourse, the negligible amounts of mobilized sediment will not be great enough to result in measurable impacts to the species or their habitat.

Roadway blading, roadway drainage improvement, unpaved shoulder reshaping and drainage dip reshaping will result in negligible amounts of sediment potentially entering watercourses. All material manipulated on roadway surfaces or along shoulders is retained on the roadway itself, it is just moved to smooth and re-slope the surface. Once graded and/or shaped, the material is compacted so that it remains in place. The minimization measures and best management practices described will keep mobilized sediment to a minimum. Paved surface cleaning is also expected to cause only a negligible amount of sediment to be potentially mobilized into stream courses. Most material cleaned from paved surfaces is organic detritus from trees and shrubs. Only a very small amount of soil is expected to be cleaned off paved roadways and the majority of that material will flow to vegetated areas away from stream courses. The negligible amounts of sediment that may be mobilized will not be great enough to result in measurable impacts to the species or their habitat.

With any heavy equipment and power tool use there is always the slight possibility of petroleum products entering the environment should a spill occur. Spill plans and best management practices for managing petroleum products should minimize the probability of runoff of hazardous materials in the unlikely event of a spill associated with power tool or heavy equipment use.

No Chinook salmon life stage is present in RNSP streams during culvert replacement or upgrading, which is planned for July – October, when all juvenile chinook are downstream in the Redwood Creek estuary. Thus, no effects to this species are expected. All of the up to ten expected culvert replacement or upgrading sites will be in the upper, non-anadromous reaches of streams. No direct adverse impacts are expected from those sites. Indirectly, some negligible amount of sediment is expected to be mobilized and transported downstream to anadromous reaches during post culvert replacement channel readjustment. The sediment amounts may affect but are not likely to adversely affect juvenile coho and steelhead.

Critical Habitat

Most of the road maintenance program activities described in this document would not impact critical habitat for the three species of listed salmonids. As described above, only minor amounts of sediment resulting from some maintenance activities, including culvert replacement or upgrading, are expected to be mobilized and transported to critical habitat areas. The minor amounts of sediment are not expected to adversely impact critical habitat.

Essential Fish Habitat

Essential fish habitat would not be impacted, or would be impacted only minimally by the activities described in this document, for the same reasons provided above relative to impacts on chinook and coho salmon and/or steelhead and their habitats.

Cumulative Effects

Cumulative effects are defined as all those state, tribal, local, and private actions that are reasonably certain to occur in the future that have the potential to impact listed species in the park. Road maintenance activities on US Highway 101 and various Humboldt county roads that run throughout the Redwood Creek watershed occur on a regular basis and may cause additional impacts to the species considered in this document, as well as salmonid critical habitat, especially if such activities occur in close vicinity to Redwood Creek and Prairie Creek.

VI. DETERMINATION

Based on the nature and timing of the proposed actions, it has been determined that the NPS routine road maintenance program in RNSP:

may affect, but is not likely to adversely affect CC Chinook and SONCC coho salmon and NC steelhead trout, nor is it likely to result in destruction or adverse modification of designated critical habitat for these species.

IX. MANAGEMENT RECOMMENDATIONS

There are no management recommendations.

X. CONTRIBUTORS

David Anderson, Fishery Biologist, Redwood National Park
Shaun Bessinger, Roads and Trails Supervisor, Redwood National Park
Barney Riley, Chief of Maintenance, Redwood National Park

Prepared By: Keith Bensen, Fish and Wildlife Biologist, Redwood National Park

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PERSONAL COMMUNICATIONS

David Anderson, Fishery Biologist, Redwood National Park

Appendix I

Maps

Roads Maintained

Presence of Anadromous Salmonids in Watersheds
That May Be Affected, But Not Adversely Affected

Redwood National Park
National Park Service



Legend

Fish Presence (RNSP)

- Chinook, Coho & Steelhead
- Coho & Steelhead
- Steelhead/Trout

Road Maintenance Status

- Operating
- Excess

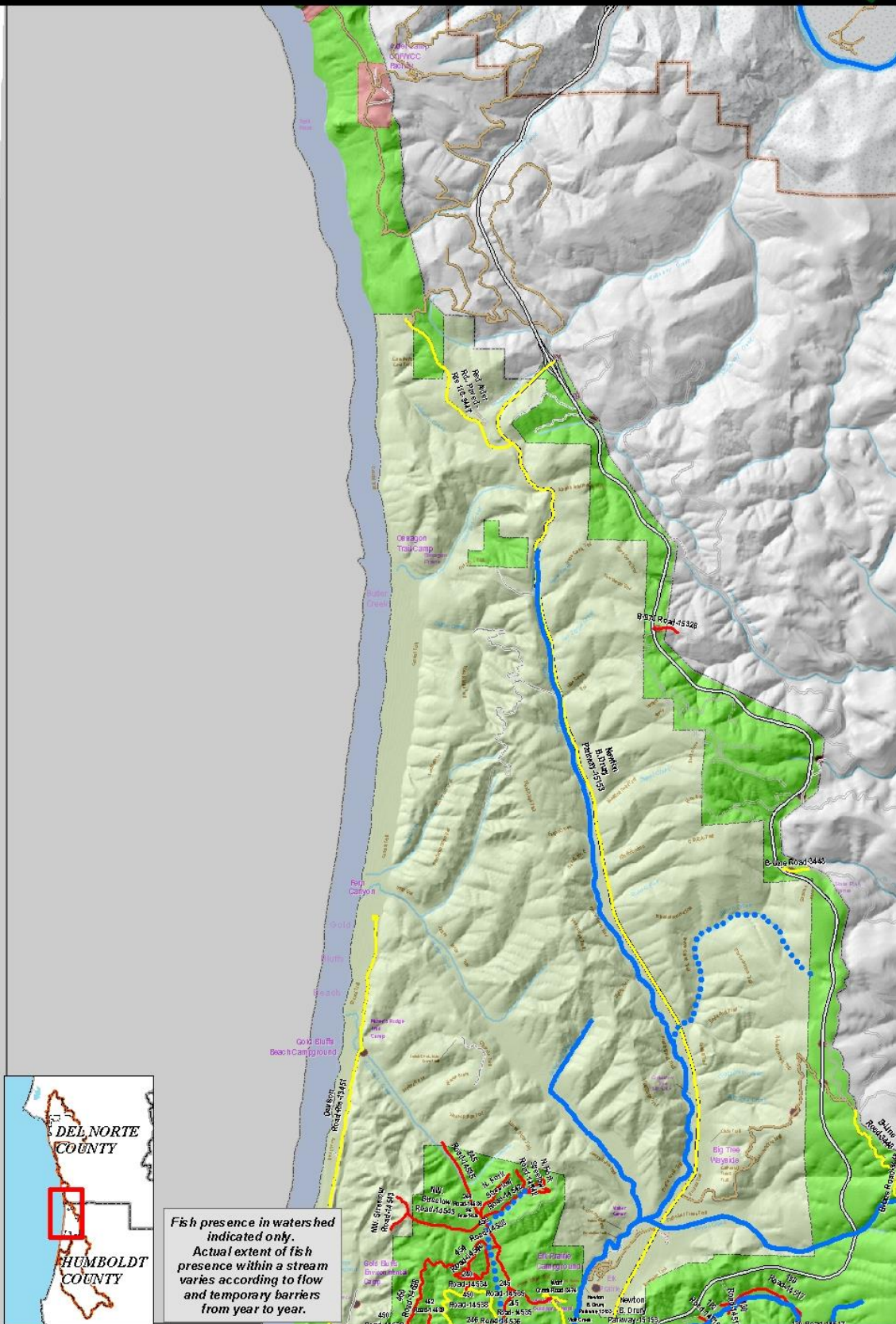
Roads

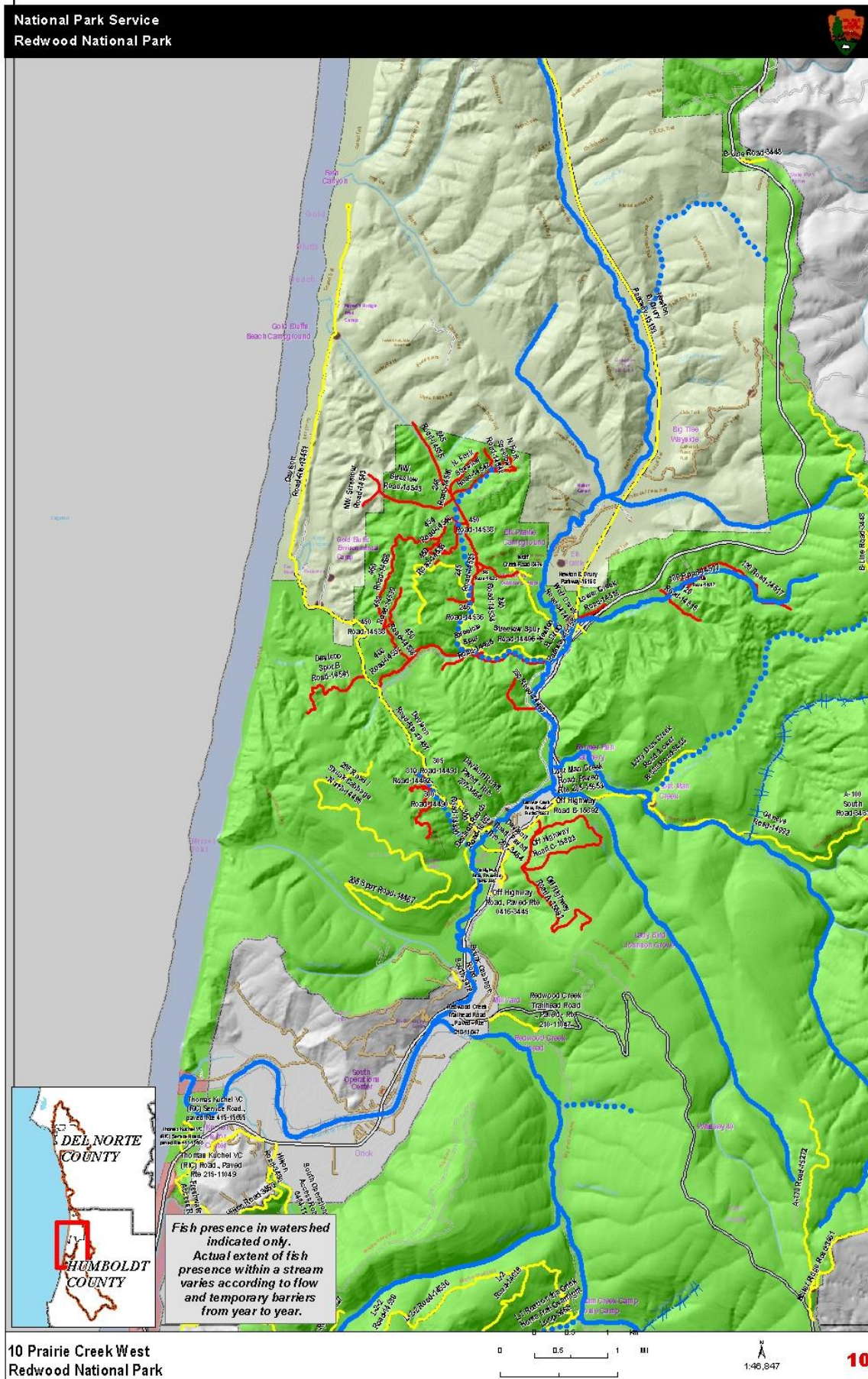
- Primary road
- Secondary road
- Tertiary road
- Other road
- Other road (not drivable)
- Decommissioned road
- Abandoned road
- Private road
- Other Public Agency road
- Gates (4K to 60K)
- Congressional Boundary (Provisional)
- Inholding
- State Park Lands
- Yurok Reservation Lands
- River
- Inholding
- NPS Lands
- NPS Lands Offshore
- State Park Lands

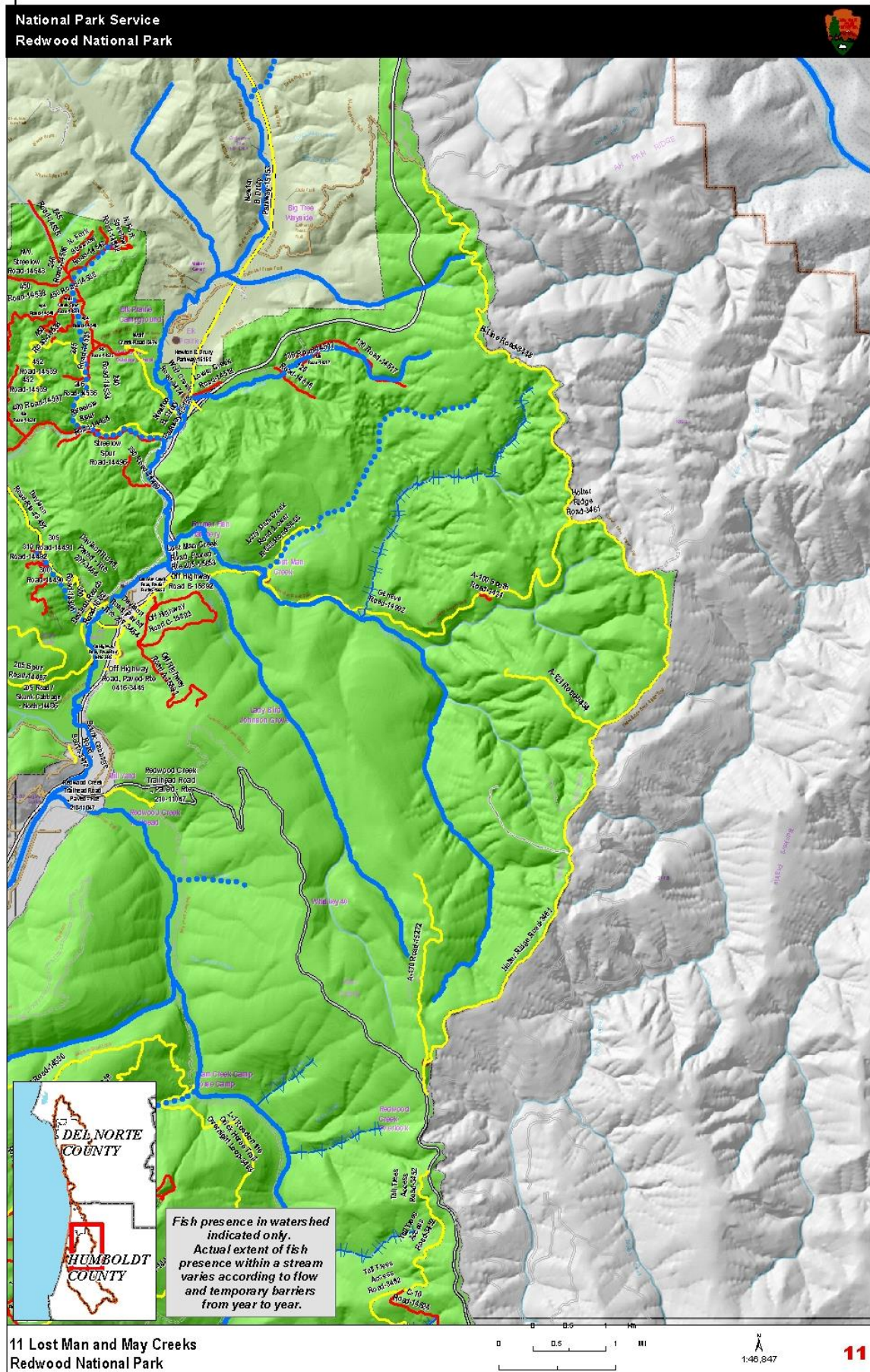


*Fish presence in watershed indicated only.
Actual extent of fish presence within a stream varies according to flow and temporary barriers from year to year.*

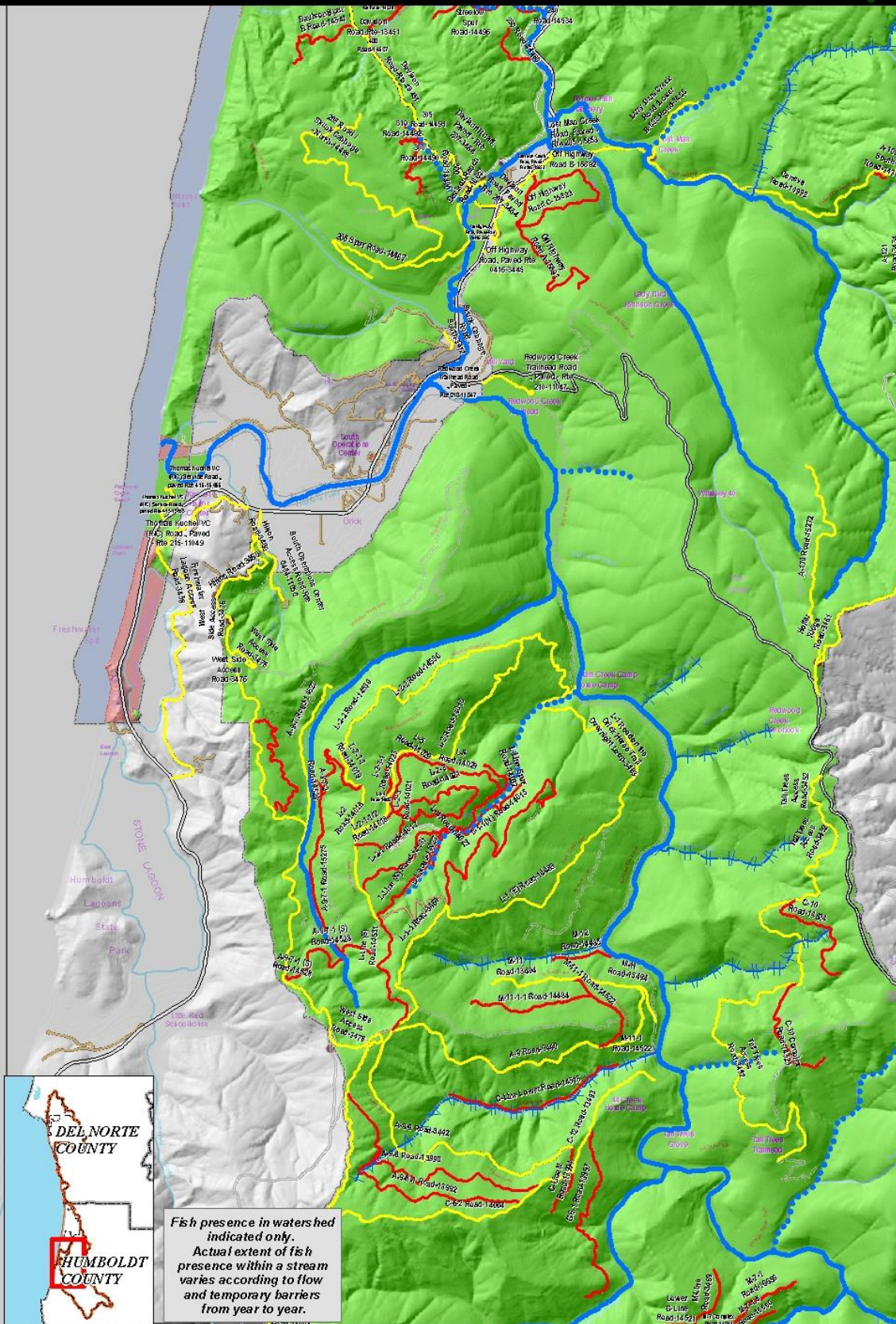
National Park Service
Redwood National Park

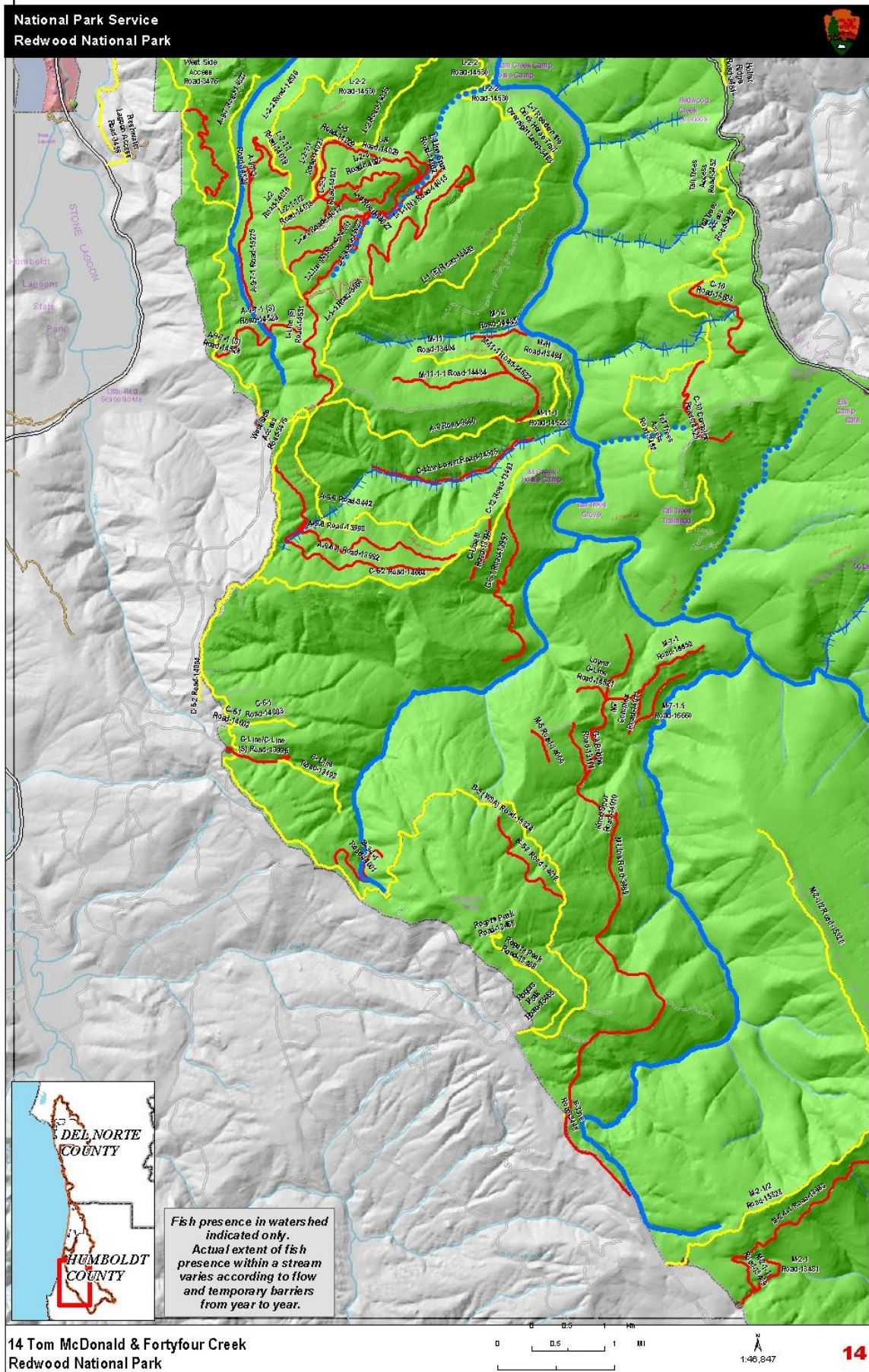




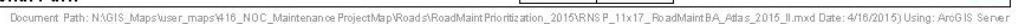


National Park Service
Redwood National Park









Appendix II

Road Maintenance Funding Criteria Ratings

Asset Priority Index Rating = road maintenance funding priority.

Operational or Excess = operational designation means a road is slated to continue to be used by the public or park staff, excess means a road is slated for removal pending future funding.

Road Name	Asset Priority Index Rating	Total Miles	Operational or Excess
Davison Road-Rte	83	3	OPERATING
Tall Trees Access Road	83	6	OPERATING
Davison Road, Paved - Rte 207	83	0	OPERATING
Newton B. Drury Parkway	81	10	OPERATING
Coastal Drive, LCS# 55734	71	3	OPERATING
Wolf Creek Road	71	1	OPERATING
Enderts Beach Rd , Paved - Rte 100	70	2	OPERATING
Red Alder Rd., Paved - Rte 110	63	1	OPERATING
205 Road / Skunk Cabbage - North	62	3	OPERATING
Schach House/Jed Smith Service Road , Paved (Shared)-Rte 040	61	0	OPERATING
	61	2	OPERATING
Coyote Peak Road	60	1	OPERATING
Howland Hill Outdoor School Road	60	11	OPERATING
West Side Access Road	60	1	EXCESS
G-6-1 Road	58	1	OPERATING
Service Area Road - Mill Creek Campground	58	0	OPERATING
Brush Dance Road-Rte 0486	56	4	OPERATING
Geneva Road	55	0	OPERATING
Thomas Kuchel VC (RIC) Road., Paved - Rte 215	53	3	OPERATING
L-1 Road on the Orick Horse Trail Overnight Loop	52	1	OPERATING
Hilton Road	52	0	OPERATING
Redwood Creek Trailhead Road ., Paved - Rte 210	52	1	OPERATING
Robbers Gulch Road-Rte 0483	52	1	OPERATING
Schoolhouse Pasture/Peak Road	52	0	OPERATING
Lookout Road	52	0	OPERATING
Thomas Kuchel VC (RIC) Service Road., paved Rte 415	50	5	OPERATING
B-5 (WSA) Road	50	4	OPERATING

B-Line Road	50	3	OPERATING
Ranch Road	50	3	OPERATING
Rock Fork Road	50	0	OPERATING
Lower Rock Fork Road	48	1	OPERATING
NOC Maintenance Road (Aubell Lane)	48	2	OPERATING
Lyons Ranch Road	48	1	OPERATING
Long Ridge Road	48	0	OPERATING
Upper Coyote Peak Road	48	1	OPERATING
Upper Lyons Road	48	0	OPERATING
Upper Mid Basin Road	46	1	OPERATING
South Operations Center Access Road-Rte 0484	46	1	OPERATING
Skunk Cabbage Road - South	46	1	OPERATING
Firing Range Road-Rte	45	3	OPERATING
240 Road	44	0	OPERATING
High Bluff Road-Rte 0	43	3	OPERATING
K&K Road	43	2	OPERATING
L-2-2 Road	42	2	OPERATING
Alder Camp Road Paved Rte 102	42	6	OPERATING
Holter Ridge Road	42	1	OPERATING
Lost Man Creek Road, Paved - Rte 205	42	1	OPERATING
Rogers Peak Road	42	1	OPERATING
C-12 Road	42	2	OPERATING
L-1 (E) Road	42	1	OPERATING
Off Highway Road, Paved-Rte 0416	42	2	OPERATING
M-11 Road	42	0	OPERATING
Lower Spring Road	42	1	OPERATING
Mid Basin Road	42	0	OPERATING
Rock Fork Spur Road	42	5	EXCESS
M-Line Road	42	3	OPERATING
Y - Line Road	42	1	OPERATING
Main Stem Road	42	2	OPERATING
A-160 Road	42	0	EXCESS
B-5-2 Road	42	2	EXCESS
L-1-1(N) Road	42	0	EXCESS
M-12 Road	42	3	EXCESS
A-9-7-1 (S) Road	41	0	OPERATING
Lane Ranch Road-Rte 0	40	0	OPERATING
NOC Water Tank Access Road	40	1	OPERATING
T. Bear Road	40	1	EXCESS
NW. Streeflow Road	40	0	EXCESS
Wolf Creek Spur Road	38	2	OPERATING
L-2 Road	36	0	OPERATING
Freshwater Lagoon Access Road	35	1	OPERATING
A-121 Road	35	3	OPERATING
A-9 Road	35	3	OPERATING

A-9-9 Road	35	1	EXCESS
A-9-6-1 Road	35	1	EXCESS
M-7 Complex Road	35	1	EXCESS
L-Line (N) Road	35	1	EXCESS
High Prairie Road	35	1	OPERATING
Spring Road	35	3	OPERATING
L-1-1 Road	35	0	OPERATING
M-2-1/2 Road	35	1	OPERATING
C-Line West Road	35	1	OPERATING
Larry Dam Creek Road /Lower B-500 Road	35	1	OPERATING
A-170 Road	35	0	OPERATING
Rudisill Road	35	1	EXCESS
G-4 Bridge Road	35	0	EXCESS
M-2-1 Road	35	1	EXCESS
M-2-1-1 Road	35	1	EXCESS
Y-2 - Line Road	35	1	OPERATING
G- Line Road	35	2	EXCESS
A-9-6 Road	35	1	EXCESS
G-Line/C-Line (S) Road	35	0	EXCESS
Knob Spur Road	35	2	EXCESS
L-2-3 Road	35	1	EXCESS
L-2-3-1 Road	35	0	EXCESS
L-2-4 Road	35	1	EXCESS
L-4 Road	35	1	EXCESS
L-5 Road	35	1	EXCESS
L-Line Spur Road	35	1	EXCESS
M-11-1-1 Road	35	1	EXCESS
230 Road	35	1	EXCESS
300 Road	35	0	EXCESS
305 Road	35	1	EXCESS
310 Road	35	0	EXCESS
Streelow Spur Road	35	0	EXCESS
School Loop Road	35	1	EXCESS
C-Line Lower Road	35	0	EXCESS
120 Road	35	1	EXCESS
130 Road	35	1	EXCESS
Lower Creek Road	35	0	EXCESS
1320 Road	35	0	EXCESS
Lower G-Line Road	35	1	EXCESS
M-11-1 Road	35	0	EXCESS
530 Road	35	1	EXCESS
A-9-7-2 Road	35	1	EXCESS
L-Line (S) Road	35	0	EXCESS
M-2 Road	35	2	EXCESS
M-2-1-1 Spur Road	35	1	EXCESS

245 Road	35	1	EXCESS
N. Fork Streelow Road	35	3	EXCESS
A-9-7-1 Road	35	0	EXCESS
B-970 Road	35	1	EXCESS
Off Highway Road A	35	0	EXCESS
Off Highway Road B	35	0	EXCESS
Off Highway Road C	35	1	EXCESS
M-7-1 Road	35	1	EXCESS
M-7-1.5 Road	34	5	OPERATING
Mill Creek Horse Trail Road-Rte	33	0	OPERATING
Davison Ranch Road	30	0	EXCESS
C-Line N Road	30	2	OPERATING
C-6-2 Road	30	0	EXCESS
Ranch - Spring Spur Road	30	1	OPERATING
205 Spur Road	30	1	OPERATING
A-9-7 Road	30	1	EXCESS
B-3-1-1 Road	30	0	OPERATING
C-6-1 Road	30	1	EXCESS
M-5 Road	30	1	EXCESS
L-2-1 Road	30	1	EXCESS
L-2-1-1/2 Road	30	1	EXCESS
L-2-1-1 Road	30	1	EXCESS
C-10 Road	30	2	EXCESS
C-30 Complex Road	30	1	EXCESS
246 Road	30	2	EXCESS
450 Road	30	0	EXCESS
452 Road	30	0	EXCESS
454 Road	30	0	EXCESS
Davison Spur B Road	29	1	EXCESS
400 Road	27	1	OPERATING
Requa Maintenance Facility Road. Paved, Rt 406 a,b, & c	23	0	OPERATING
Menezes Road	23	3	EXCESS
A-100 South Road	19	0	OPERATING
Orick Hill Boundary Road	12	0	OPERATING



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

Refer to NMFS No: WCR-2015-2857

JUL 10 2015

Mr. Stephen Prokop
Superintendent
Redwood National Park
1111 Second Street
Crescent City, CA 95531

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens
Fishery Conservation and Management Act Essential Fish Habitat Response for the
Redwood National Park Routine Road Maintenance Program

Dear Mr. Prokop:

On May 6, 2015, NOAA's National Marine Fisheries Service (NMFS) received your request for a written concurrence that the Redwood National Park (RNP) Routine Road Maintenance Program (program) is not likely to adversely affect (NLAA) the following threatened species and their critical habitats designated under the Endangered Species Act (ESA): (1) Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) Evolutionarily Significant Unit (ESU) (70 FR 37160, June 28, 2005), (2) California Coastal (CC) Chinook salmon (*O. tshawytscha*) ESU (70 FR 37160, June 28, 2005), (3) Northern California (NC) steelhead (*O. mykiss*) Distinct Population Segment (DPS) (71 FR 834, January 5, 2006), (4) SONCC coho salmon ESU critical habitat (64 FR 24049, May 5, 1999), (5) CC Chinook salmon ESU critical habitat (70 FR 52488, September 2, 2005), and (6) NC steelhead DPS critical habitat (70 FR 52488, September 2, 2005). This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

NMFS also reviewed the proposed program for potential effects on Pacific salmon (coho salmon and Chinook salmon) managed under their respective Fishery Management Plans (FMPs) as essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the program. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.



This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through NMFS' Public Consultation Tracking System (http://sero.nmfs.noaa.gov/protected_resources/section_7/pcts/index.html). A complete record of this consultation is on file at the NMFS Arcata office.

Proposed Action

The 2015-2025 Road Maintenance Program will improve a maximum of 173 miles of road within Redwood National Park boundaries. Construction activities will occur between June 1 and October 15 during dry conditions, defined as the normal operating season (NOS). If periods of dry weather are predicted outside of the NOS, additional small work items may be done, if they can be completed within the window of predicted dry weather. Only those road repairs needed to reduce risks from active erosion will be undertaken outside of the NOS, in coordination with NMFS.

The proposed program includes stream culvert replacement and road improvement activities. A maximum of 10 undersized, leaking, and worn out culverts will be replaced with 100-year flood capacity culverts at the rate of one culvert per year. All culvert replacement will occur in tributaries, upstream of anadromy (RNSP 2015). Prior to excavation, water will be diverted out of the construction area. A small amount of existing riparian vegetation, such as small trees and shrubs, will be removed from culvert excavation areas as needed for heavy equipment access. Excavation will use backhoes, excavators, bulldozers, loaders, dump trucks, and compaction equipment. Excavated fine sediment materials will be placed in an upstream location. The size of the new culvert will be based on hydrologic modeling of the watershed, stream size, stream gradient, and estimated 100 year cubic foot/second stream flow. The new culvert will be placed to maintain a uniform flow line from inlet to outlet channel. Backfill will be compacted using vibratory equipment. If additional material is required for backfill, three-quarter inch gravel will be added. The area will be compacted, mulched, and re-vegetated with native riparian species. Rock rip rap will be placed around the newly replaced culvert to prevent erosion.

Road improvement activities will smooth and maintain the roadways, manage sediment and vegetation, improve stream crossings and drainage structures, including inboard ditches, and maintain cattle guards and signs. Blading, spot surfacing, and asphalt patching will smooth worn and damaged road surfaces. Inboard ditches will be eliminated anywhere possible, and side casting will not occur in hydrologically connected road segments. When approaching a stream crossing, the operator pulls the material on to the road surface and uses a loader to move the materials offsite. Paved roadway surfaces will be cleaned of loose material using power brooms or blowers, trucks with rock blades, and a grader. Sediment management activities will repair areas that may currently be contributing fine sediments to waterways including unpaved road shoulders, plugged ditches, and slump material. Hydraulic flushing may be used to clear out ditch relief culverts that are not hydrologically connected to the Redwood Creek stream network. Unpaved road shoulders will be reshaped to their original configuration using a motor grader. Ditches will be cleared of materials including rock, wood, and soil and re-graded using a motor grader and/or backhoe. Slump fill material will be hauled to upslope disposal sites using a wheel

loader, dump truck, compactor, motor grader, or backhoe. Drainage structures such as catch basins, inlet and outlet channels, and ditch line transition areas will be cleared mostly by hand, or using a backhoe if necessary. Excavated materials will be placed in upslope areas. Eroded areas will be revegetated with native species using seed mulch and hand planting. Roadway vegetation will be cut back to less than 12 inches in diameter six inches above the ground to improve sight distance and provide overhead clearance using chainsaws or a mechanical brush cutter.

Equipment, both hand tools and heavy equipment, will be inspected daily to check for leaks. Equipment that may leak lubricants or fuels will not be used until leaks are repaired. All equipment will be stored, serviced and fueled at least 200 feet from stream crossings. Heavy equipment will be cleaned (e.g., power washed, steam cleaned) prior to use below the ordinary high water mark. A spill plan and materials for spill containment will be available to onsite personnel and all personnel shall know how to use them. In the event of a spill, work shall be stopped immediately, clean-up will begin and the appropriate authorities will be notified. All vehicles and equipment entering the project area would be free of oil leaks. Any oil leaks occurring after equipment entry at the site would be repaired immediately upon discovery and no leaking equipment would be used. Approved absorbent materials would be kept on site in the event of a spill. Equipment would be cleaned and repaired (other than emergency repairs) at an established maintenance facility. All contaminated water, sludge, or other hazardous compounds would be disposed of at a lawfully permitted or authorized location. All fuel and lubricating material containers would be located in stable, secure locations.

Other minimization measures include: 1) material removed from a ditch will be disposed of outside of any waterway or wetland, 2) erosion control devices such as check dams, silt fences, and other acceptable techniques, will be used when the potential exists to have sediment or other materials entering water bodies, 3) drainage ditches and steep slopes shall be reseeded with native plants, 4) chip seal (asphalt emulsion) will not be applied in a manner that will create runoff or product delivery into streams; chip seal will not be applied during rain and requires a clear 2 day forecast following the projected completion of application; chip seal treated surfaces will not be washed, and 5) any disturbed ground must receive appropriate erosion control treatment (mulching, seeding, planting, etc.) prior to the beginning of the wet season. Operations will use all feasible techniques to prevent any sediment from entering a drainage system.

Action Area

Based on road and stream networks, and road maintenance methods that are described in the Biological Assessment (BA) for this program (RNSP 2015), the action area is the Redwood Creek watershed, including the Prairie Creek sub-watershed, within Redwood National Park boundaries. Roads maintained by RNP are shown in Appendix I of the BA (RNSP 2015).

Action Agency's Effects Determination

Culvert replacement, stream crossing repair, and road improvement activities may adversely affect CC Chinook salmon, NC steelhead, and SONCC coho salmon by a temporary increase in turbidity. The majority of project activities will occur on or directly adjacent to roadway

surfaces that are located upslope and away from Redwood and Prairie creeks and other tributaries. Culverts to be replaced occur in areas upstream of anadromous reaches. In order to minimize project related turbidity, construction activities will occur during dry conditions (June 1-October 15). RNP has determined that the proposed project will not adversely affect CC Chinook salmon, NC steelhead, or SONCC coho salmon or their designated critical habitats.

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

SONCC ESU coho salmon are currently distributed within the lower and middle sections of Redwood Creek, but are mostly found in the Prairie Creek sub-watershed and the lower sections of tributaries to lower/middle Redwood Creek. CC ESU Chinook salmon are distributed throughout the mainstem of Redwood Creek and Prairie Creek. NC DPS steelhead are distributed throughout the Redwood Creek basin, however tributaries to mainstem Redwood Creek often contain steep channel gradients which limit steelhead distribution to the lower sections of most tributaries. The Redwood Creek watershed contains migratory, rearing and spawning habitat for coho salmon, Chinook salmon and steelhead, and all life stages of salmonids are found within the action area in this watershed. The Redwood Creek watershed contains designated critical habitat for SONCC ESU coho salmon, CC ESU Chinook salmon and NC DPS steelhead, within the mainstem of Redwood and Prairie creeks, and within the lower sections of most other tributaries to Redwood Creek.

Effects of the Action on Listed Species

The program has the potential to result in sediment delivery to the stream channel network through ground disturbing activities and the delivery of petroleum products to the stream network through the use of heavy equipment or power tools within and near riparian zones, and from chip seal or asphalt patching on roadways. However, the program incorporates numerous Best Management Practices (BMPs), and minimization measures to prevent or minimize sediment or petroleum product delivery to the stream network. In addition, RNP has implemented a similar program since 2008, and implementation monitoring indicates that RNP has successfully implemented BMPs and specific program design features aimed at preventing or minimizing the risk of sediment and petroleum products from entering the stream network.

Sediment

The effects of the proposed program may include a small, temporary increase in mobilized sediments. Newly placed culverts may experience minor adjustments during the first winter

following placement. However, culvert replacement will occur during the dry season (May-October) and upstream of anadromy, where no life history phase of any listed species is expected to be present. Road repair work including ditch cleaning, rolling dip construction and side casting may also result in a small, temporary increase of suspended fine sediments. However, most ditches and cross drains discharge onto stable slopes and are not hydrologically connected to Redwood Creek or tributaries. In the event of road repair in areas hydrologically connected or in close proximity to waterways (less than 50 feet), it is anticipated that project-related sediments may occur in trace amounts from ditch cleaning, road surface blading, rolling dip construction or stream bank channels that may adjust after culvert replacement.

All material manipulated on roadway surfaces or along shoulders is retained on the roadway itself, and once graded and/or shaped, the material is compacted so that it remains in place. Paved surface cleaning is also expected to cause only a negligible amount of sediment to be potentially mobilized into stream courses. Most material cleaned from paved surfaces is organic detritus from trees and shrubs. Only a very small amount of soil is expected to be cleaned off paved roadways and the majority of that material will deposit in vegetated areas away from stream courses. Due to the project location (culvert replacement upstream of anadromy, most other work occurring in areas not hydrologically connected to Redwood Creek and its tributaries), timing (dry season), and other proposed BMPs and minimization measures for reducing sediment, only very small amounts of sediment may be delivered to stream channels during the winter season when background levels of suspended sediment are already high. Thus, the potential for exposing salmonids of all species and life stages to increased suspended sediment caused by program activities is negligible, and the expected response of salmonids to a negligible increase in turbidity will be insignificant.

Petroleum Products

With any heavy equipment and power tool use there is the possibility that petroleum products may enter the stream network, either through spills or leaks. Spill plans and best management practices for managing petroleum products should prevent or minimize the probability of runoff of hazardous materials in the unlikely event of a spill or leak associated with power tool or heavy equipment use. All asphalt material will be fully cured before any precipitation falls, thus preventing any pollutants from entering the stream network. In addition, most heavy equipment is proposed for use outside of riparian areas, in upland locations. Therefore, the potential for exposing salmonids to petroleum products (all species and life stages), is discountable.

Effects of the Action on Critical Habitat

The program will have very limited effects to critical habitat from ground disturbing activities causing a negligible increase in turbidity, and from the small possibility of petroleum product entering the stream network and decreasing water quality. However, as described in the *Effects to Listed Species* section above, and as described in the BA (RNSP 2015), the likelihood of sediment entering the stream network is low and the amount of sediment would be very small and diluted by background turbidity during winter storms, thus we do not expect increased sediment to settle in pools or affect downstream spawning gravels. Therefore, the effects of project-related sediment on critical habitat are insignificant. As previously described, the chance of petroleum products entering the stream network is discountable.

Conclusion

Based on this analysis, our review of the documents provided by RNP, and based on our review of site conditions within the action area, NMFS concurs with RNP that the proposed program is not likely to adversely affect threatened SONCC coho salmon, CC Chinook salmon, NC steelhead or their designated critical habitats.

Reinitiation of Consultation

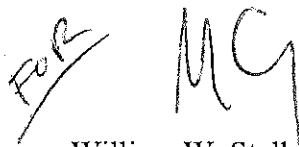
Reinitiation of consultation is required and shall be requested by RNP or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. NMFS determined the proposed action would adversely affect EFH due to a temporary increase in turbidity during culvert replacement activities. The Proposed Action section identifies BMPs which will minimize the potential adverse effects to EFH to the extent practicable. The listed avoidance, minimization, and mitigation measures are adequate in offsetting and minimizing and adverse effects to EFH. Therefore, NMFS has no additional conservation recommendations for the proposed action.

Please contact Ms. Leslie Wolff in Arcata, California at (707) 825-5172, or via email at Leslie.Wolff@noaa.gov, if you have any questions regarding this consultation.

Sincerely,

The image shows a handwritten signature in black ink. The signature is stylized, with the first letters of the first and last names being prominent. It appears to read 'WWS' followed by a surname that starts with 'S'.

William W. Stelle, Jr.
Regional Administrator

cc: Keith Bensen, RNP

bcc: CHRON File (pdf)
Division- File copy

REFERENCES CITED

Redwood National and State Parks (RNSP). 2015. Biological assessment of impacts to aquatic threatened species from Redwood National Park Routine Road Maintenance Program. April 2015.

