Eldorado National Forest
Placerville Ranger District

Aquatic Species Biological Assessment and Evaluation for the Last Chance Fuels Reduction Project

2003

Prepared By: /s/ Gregg Jennings Date: March 10, 2003
Gregg Jennings
Wildlife Biologist

Prepared By: /s/ Jann Williams Date: March 10, 2003
Jann Williams
Forest Fisheries Biologist

I. INTRODUCTION

Forest Service Manual (FSM) 2672.42 directs that a biological assessment (BA) be prepared for all proposed projects that may have effects upon U.S. Fish and Wildlife Service (USFWS) listed threatened, endangered, and proposed species. In addition, FSM 2670.32 directs that a biological evaluation (BE) be prepared to determine the effects of proposed projects on Forest Service Region 5 designated sensitive species. The purpose of these documents is to ensure that project decisions do not adversely affect species viability or create significant trends towards Federal listing. This document will analyze the potential effects of proposed Last Chance Fuels Reduction Project for both federally listed threatened, endangered, candidate aquatic species and Region 5 listed sensitive species.

II. CONSULTATION TO DATE

Pursuant to Section 7(c) of the Endangered Species Act, the USFWS is contacted to obtain a current list of threatened, endangered, proposed, and candidate species that may be present on the Eldorado National Forest (ENF). The most recent quarterly species list for the ENF was dated January 23, 2003 and obtained from the USFWS website (http://sacramento.fws.gov/es/spp_lists/NFFormPage.htm). This list is available for review at the Forest Supervisors office.

On January 29, 2002, a telephone conversation between Shannon Ludwig of USFWS and Jann Williams, Forest Fisheries Biologist, discussed surveys needed to adequately determine presence of California red-legged frogs and their habitat in the Clear Creek area. Shannon stated that after surveys to USFWS protocol are performed in suitable habitat, as identified from surveys using the ENF California Red-legged Frog Habitat Suitability Protocol, then a no effect determination could be substantiated.

This document analyzes the potential effects of the proposed projects upon the following federally listed threatened, endangered, candidate, and Region 5 sensitive aquatic species. Candidate species are managed as sensitive species by the USFS:

Federally Listed Threatened (T) and Endangered (E), and Candidate (C) Aquatic Species

California red-legged frog and its critical habitat (*Rana aurora draytonii*), T
Central Valley fall/late-fall run chinook salmon (*Oncorhynchus tshawytscha*), C
Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), T
Central Valley steelhead (*Oncorhynchus mykiss*), T
delta smelt (*Hypomesus transpacificus*), T
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), T
mountain yellow-legged frog (*Rana muscosa*), C
Sacramento splittail (*Pogonichthys macrolepidotus*), T
Sacramento winter-run chinook salmon (*Oncorhynchus tshawytscha*), E
Yosemite toad (*Bufo canorus*), C

US Forest Service Region 5 Designated Sensitive Aquatic Species

foothill yellow-legged frog (*Rana boylii*)
hardhead (*Mylopharodon conocephalus*)
western pond turtle (*Clemmys marmorata*)
northern leopard frog (*Rana pipiens*)

III. CURRENT MANAGEMENT DIRECTION

Direction to maintain the viability of Region 5 endangered, threatened, and sensitive species is provided by the National Forest Management Act, the Code of Federal Regulations (CFR 219.19), the Forest Service Manual (FSM 2672), and the Sierra Nevada Forest Plan Amendment Environmental Impact Statement (EIS). This Amendment guides the management of the Sierra Nevada national forests until their forest plans are revised. The aquatic, riparian, and meadow conservation strategy in the EIS will provide clean water, functioning aquatic ecosystems, and environmental conditions that contribute to viable populations of associated species (USDA 2001b).

Current Forest Service policy (FSM 2670) is to manage National Forest system lands so that the special protection measures provided under the Endangered Species Act will no longer be necessary, and threatened or endangered species will become de-listed. The Sierra Nevada Forest Plan Amendment Environmental Impact Statement (EIS) provides direction for the management of threatened and endangered species. The Aquatic Management Strategy in the EIS directs that the Forests utilize administrative measures to protect and restore aquatic, riparian, and meadow ecosystems and provide for the viability of native animal species associated with these ecosystems. The following Aquatic Management Strategy goals pertain to aquatic endangered, threatened, and sensitive species:

- To maintain and restore water quality to meet goals of the Clean Water Act and Safe Drinking Water Act, providing water that is fishable, swimmable, and suitable for drinking after normal treatment.
- To maintain and restore habitat to support viable populations of native and desired riparian-dependent species.
- To maintain and restore the species composition and structural diversity of animal communities in riparian areas, wetlands, and meadows to provide desired habitats and ecological functions.
- To maintain and restore the distribution and health of biotic communities in species aquatic habitat to perpetuate their unique functions and biological diversity, and
- To maintain and restore spatial and temporal connectivity for aquatic and riparian species within and between watersheds to provide physically, chemically and biologically unobstructed movement for their survival, migration and reproduction.

According to the EIS, a Riparian Conservation Objectives analysis would need to be performed for projects occurring within Riparian Conservation Areas, and is included in the project file.

IV. DESCRIPTION OF PROPOSED PROJECT

The Last Chance Fuels Reduction project is proposed to establish a system of fuel reduction zones along primary ridges in the Henry's Diggings and Leoni Meadow areas, south of Grizzly Flat, in El Dorado County, California. Treatments are designed to strategically connect in with fuel reduction work already accomplished along Caldor Railroad Grade, Plummer Ridge and in the Clear Creek area. The areas proposed for treatment form the base for establishing contiguous fuel treatments along ridges from the community of Grizzly Flat southeast to Leoni Meadow.

Location of Treatments

Map locations (see the EA) and acreages are estimates obtained from orthographic photos, maps and field reconnaissance. Actual acres typically change slightly, as final project layout is completed, and adjustments are made for site-specific conditions, although the total area treated is not likely to fluctuate more than 10%.

The project proposal is to create a defensible space by reducing fuels on approximately 1700 acres by thinning the understory on approximately 600 acres, masticating brush and burning piles on approximately 150 acres, hand pruning trees within 100 feet of private property on approximately 50 acres, and low-intensity underburning on approximately 1300 acres.

The Proposed Action would comply with the Eldorado National Forest Land and Resource Management Plan (LRMP) as amended by the Sierra Nevada Forest Plan Amendment (SNFPA) Environmental Impact Statement, as described in the SNFPA Record of Decision (ROD). Specifically, the proposed action is designed to meet objectives based on Forest-wide standards and guidelines (ROD, pages A-25 to A-32), as well as land allocation standards and guidelines for Northern Goshawk and California Spotted Owl Protected Activity Centers (PACs) (ROD, pages A-33 to 37), and Urban Wildland Intermix Defense and Threat Zone standards and guidelines (ROD pages A-46 and A-47).

The following actions and protective measures for potentially affected resources are directly related to the implementation of the actions described above.

A. Vegetation Treatments

In all stands, silvicultural prescriptions would be based on stand-specific information and designed to meet SNFPA land allocation guidelines for the amount of the stand treated, residual live crown base height, and diameter limits. Generally, silvicultural goals for this area are to protect large trees, increase growth of medium sized trees, and remove smaller trees to reduce fuel ladders. Forest-wide stand structure standards and guidelines pertaining to large trees, canopy cover, snags, and large down wood apply in all land allocations, and would be met where they currently exist. Species preference for residual trees in descending order of priority is: sugar pine, ponderosa pine, Douglas-fir, white fir, and incense cedar. Black oaks would not be designated for removal although some may be removed to facilitate operations. Snags which pose a hazard to treatment operations would be removed, or felled and left in log deficient areas.

Where necessary, concentrations of existing or activity generated fuels within the units would be treated by a combination of tractor piling with a brush rake, mastication with a brush shredder, and/or hand cutting and piling. Generally these acres occur where fuels have built up from previous tree mortality, but would also include pockets of decadent brush or thickets of suppressed small diameter trees. Tractor piling would also be utilized in smoke sensitive areas where smoke from burning tractor piles would dissipate more quickly than smoke from prescribed burns. Tractor piling would not occur within riparian conservation areas (RCAs), sensitive areas (such as heritage sites and sensitive plant habitat), or on slopes greater than 35%. Residual trees would be protected from mechanical damage. Piles would normally be burned in the fall and winter after adequate time for curing.

Post treatment evaluations of site-specific fuel conditions would be done to determine the need for follow-up prescribed burning. Prescribed understory burning would occur when weather conditions prescribed in the burn plan are met. Prescribed fire would be allowed to back into the RCAs, however, ignition would not occur in RCAs, except as needed to maintain control.

In preparation for prescribed fire some perimeter line construction may be needed where roads, trails, or natural barriers are absent. This would involve hand cutting of vegetation including trees up to 6-inch diameter, pruning, and scraping a bare soil control line. All fire lines would follow the established guidelines for water bar construction as outlined in the watershed Best Management Practices (BMPs). Hand lines visible from roads would be camouflaged by raking duff back to discourage use as a trail after burning.

Ground cover objectives for prescribed burns are determined by the LRMP and through consultation with resource specialists. Several years of BMP monitoring of prescribed fire

projects indicate that ground cover objectives are being met by implementation of current burn plans. Post burn observations of ground cover and soil stability would be conducted to determine if additional action is needed.

Burn prescription parameters would be designed to achieve a fire with an average of 4 foot or less flame lengths. Burn objectives also include protection of sensitive features such as archaeological sites, sensitive plant populations, nest trees, specific snags or down logs, oak trees, streamside zones, structures, and other improvements. Site-specific prescriptions would be developed for these areas, and range from keeping fire out completely, to allowing fire to burn through but retaining the important features.

Mechanical treatment units 121, 227, 232, 237, 246, 247, 259, 268, 269, and 277 are fully or partially within California Spotted Owl (CSO) or Northern Goshawk PACs. These units are also within the defense zone. Mechanical treatments would occur except within the 500' radius buffer around the activity center. Prescribed fire and preparatory hand treatments are allowed in the 500' buffer. Prior to burning, hand treatments, including handline construction, tree pruning, and cutting small trees less than 6 inches in diameter, are allowed within a 1 to 2 acre area surrounding known nest trees as needed to protect these trees (ROD, p. A-35). In CSO PACs that are outside of the defense zone (units 290, 302, 303, 304, 616, 623, and 646) mechanical treatments would not occur. Prescribed fire, with an average flame length of 4' or less, and preparatory hand treatments are planned. Prior to burning, hand treatments (including handline construction, tree pruning, and cutting small trees less than 6 inches in diameter) are allowed within a 1 to 2 acre area surrounding known nest trees as needed to protect these trees (ROD, p. A-35).

B. Air Quality

A smoke permit would be issued for this project by El Dorado County Air Pollution Control District. To reduce effects of prescribed burns on air quality, smoke control and monitoring measures would be identified in the Smoke Management Plan. Avoidance (not burning when smoke would not disperse well, or would carry into sensitive areas), dilution (reducing smoke concentrations by staggering ignitions, or burning when there is good lift and dispersion), and emission-reduction strategies would be utilized.

Desirable meteorological conditions such as favorable winds and an unstable or neutral atmosphere would be required in the project's smoke management plan to facilitate venting and dispersion of smoke from the project area. Piles with larger materials would be cured for a minimum of 90 days. Smaller sized material would cure 30 to 45 days to reduce the duration of smoke emissions.

C. Visual Resources

Blackened trees that negatively affect the viewshed would be felled.

D. Heritage Resources

Archaeological sites in the project area would be protected from ground disturbance associated with mechanical and hand treatments during all phases of this project. A full listing of these sites can be found in the project file. Sites in units or near road maintenance/reconstruction projects would be identified with flagging and avoided during project activities. Sites that are flammable (i.e. cabins, corrals, fences, flumes, trestles) would be protected during prescribed burning. All sites would be avoided during fire line construction.

E. Terrestrial Wildlife

A limited operating period (LOP) for California spotted owls would be in effect from March 1 through August 31, for units within ¼ mile of spotted owl activity centers, unless surveys confirm

that owls are not nesting. A LOP for northern goshawks would be in effect from February 15 through September 15, within ¼ mile of goshawk nesting areas, unless surveys confirm that goshawks are not nesting.

A LOP for mule deer would be in effect from October 15 through April 15 for units within critical winter range. An exception to the mule deer LOP (March 15 versus April 15) would be used for the west end of the project area to accommodate burning conditions to treat decadent brush fields. If adverse winter conditions occur during the year(s) of the planned burn(s) and cause deer to remain in these areas past March 31, the LOP time frame would be re-evaluated by the wildlife biologist to assess if the standard LOP of April 15 is needed to avoid disturbance.

LOPs generally apply to all project activities except use and maintenance of forest roads. Additional activities may be permitted, such as handwork, dependent on a site-specific analysis of species status. Consult with wildlife biologist prior to burning to determine presence of TES and/or species of concern. Burning would be postponed if it is determined potential adverse impacts to these species would occur.

Project design would increase diversity of age classes of brush and oak species to enhance habitat for deer, quail, and neo-tropical migratory birds.

F. Fish and Aquatic Species

Riparian Conservation Objectives (RCOs) would be applied within Riparian Conservation Areas (RCAs) to protect habitat for aquatic species, including the Sensitive species of western pond turtles and foothill yellow-legged frogs. No mechanical treatments would occur, and no piles would be created, within the 600 foot wide RCAs along Steely Fork Cosumnes and Clear Creek. No ignition for underburning (except that necessary to maintain control of the underburn) would occur within these RCAs.

Water drafting guidelines described in the Transportation section would protect fish and amphibians. Water holes would be inspected by a fisheries biologist for existing frogs and tadpoles before water withdrawal for dust abatement.

G. Sensitive Plant Protection

Within the project area, there are three occurrences of Pleasant Valley mariposa lily (*Calochortus clavatus* var. *avius*) or CACLA, which would be monitored and flagged prior to implementation to ensure that the sites are not disturbed by equipment. If any other sensitive plant occurrences are discovered during project implementation their habitat would also be flagged and avoided during project activities and the locations reported to the Forest botanist and Placerville District biologist. Lava caps within the project area would be protected from motorized vehicles and equipment. No tractors or other equipment would be allowed to enter these unique habitats.

Mulch or straw used for vegetative soil stabilization would be certified weed free. Weed-free rice straw is readily available and is the preferred mulch for this project. Any seed used for restoration or erosion control would be from a locally collected source (ENF Seed, Mulch and Fertilizer Prescription, March 21, 2000).

H. Noxious Weeds

The project area has been surveyed for noxious weeds. Two occurrences of skeletonweed (*Chondrilla juncea*) and a single scotch broom (*Cytisus scoparius*) site have been documented. A Noxious Weed Risk Assessment has been written (ENF 2002). This assessment looked at the current infestation sites and determined areas of potential invasion/spread from natural, non-project and project related activities. Known occurrences, as well as these potential infestation areas would be analyzed for treatment in the EA. In order to prevent expansion, and eradicate existing infestations, various treatment methods would be utilized.

The prevention and eradication strategy includes the following:

- All off-road equipment would be cleaned to insure it is free of soil, seeds, vegetative matter or other debris before entering National Forest system land if it is known to have most recently operated in an area infested with noxious weeds, or if the last operating location is unknown. In addition, clean equipment prior to moving from an infested treatment unit, to a unit that is free of such weeds.
- Locations of any new infestations of noxious weeds would be mapped and documented. New sites would be treated by hand pulling or lopping (late summer/early fall lopping treatments have been shown to minimize resprouting).
- Post fuels treatment surveys would be conducted at the documented sites. Grub or hand-pulled populations prior to seed-set. Where appropriate, seeding of weed-treated areas with native grass species would be done to reduce, through competition, further weed establishment or expansion of existing infestations.

I. Soils and Hydrology

Implementation of measures to ensure protection of soil resources and long-term soil productivity (R5 Soil Quality Standards), are derived from "Best Management Practices" (BMPs) and input provided by the IDT for this project. A listing of the BMPs, to be implemented, is in the project file. Soil monitoring following treatment activities would be completed to confirm effectiveness of applicable BMPs.

Large woody material requirements would be satisfied by meeting SNFPA standards for down log retention. The SNFPA standard of at least 10 tons per acre of the largest down logs available would be maintained within mechanical treatment units, except in areas where existing levels are less than that (5 30" x 32' logs = 10 tons). Where possible, these large down logs would be protected during mechanical treatment activities, and underburning. Class 1 and 2 logs would be recruited from cull logs where they are available.

To control erosion rates, and the resulting sediment delivery, ground cover and fine organic matter would be maintained as follows: a minimum of 40 percent on units with less than 15 percent slope, 60 percent on units with 15 to 30 percent slopes, and 70 percent on units with slopes over 30 percent and in RCAs. The percent of organic matter would vary depending on the amount available on site or on the site capability. Mechanical treatment activities would be restricted and/or controlled during high soil moisture conditions. The specific restrictions needed would depend on the type of equipment being used and on the condition of the area at the time (e.g. if the ground is covered with slash, some equipment use may be allowed). The type of restrictions applied by the project administrator may include: allowing several days of drying after precipitation prior to resuming activities; restricting motorized equipment to skid trails; or limiting operations to loading and hauling. All applicable BMPs would be implemented to prevent the concentration of water flows that could increase rill and gully formation.

No new landings would be constructed within RCAs. No existing landing within an RCA would be used if unstable. After use, landings would be scarified, shaped, and ditched as needed to minimize soil displacement, and facilitate revegetation; and replanted.

Wet areas or seeps would be avoided by and buffered from all mechanical and fuels treatment activities. Consultation with a geologist or hydrologist would be conducted prior to implementation to assure that hydrological functioning is maintained.

For seasonal streams: The RCA would be 150 feet on each side of the stream. Mechanical treatments are allowed in the outer 100 feet of the RCA. The “arm” of a feller-buncher (or similar equipment) may be extended into the inner 50 feet to remove trees. Skid trails would not be constructed within RCAs, although some existing trails may be used within RCAs where

construction of an additional trail would result in additional disturbance. Equipment would be excluded where slopes within or adjacent to the RCA exceed 30 percent, and within the inner 50 feet of stream RCAs. Designated stream course crossings would be agreed to by the project administrator and the operator prior to construction or use. No pile burning would occur within the inner 50 feet of RCAs. Underburning may occur in RCAs as long as fire is allowed to back down toward the stream, and no ignition occurs within riparian vegetation. Avoid constructing hand lines within the RCA, however if needed to control the fire, then hand lines should be raked over to cover bare soil and reduce runoff.

For perennial streams The RCA would be 300 feet on either side. When the stream or portions of the stream course is within the inner gorge area (adjacent to slopes greater than 70% gradient), then the top of the inner gorge (as defined by the geomorphology map) would define the RCA. No ground disturbing activities or pile burning would occur within the RCA except hand cutting of vegetation. Underburning would occur within the Steely Fork Cosumnes RCA. The fire would back down toward the stream, no ignition would occur (except that necessary to maintain control of the underburn) within the RCA and burning would occur under high fuel moisture conditions.

J. Transportation

The primary access into the area is via the El Dorado County road system of Caldor Railroad Grade (9N45), 9N65, and Grizzly/Caldor Road (9N73). Access to unit 291 is dependent on the Forest Service acquiring rights of way from private landowners. No new road construction needs have been identified. Short temporary roads (low standard roads, which are obliterated after use) may be needed where landings are located away from existing roads. No temporary roads would be constructed within RCAs without consultation with a hydrologist. Obliterate all nonsystem roads.

Maintenance of system roads used by this project would generally consist of the following:

Brushing - Cut and prune brush and small trees along roads 9N65, 9N65A, 9N65B, 9N65C, 9N65D, 9N65E, 9N45, 9N61, and portions of 9N59. Dispose of slash by chipping, scattering, or piling and burning.

Drainage - Existing ditches and culverts would be cleaned out. Additional dips or waterbars would be constructed as needed. Road surfaces would be bladed and compacted.

Dust Abatement and Water Drafting - Water would be used on native surface roads to maintain surface fines, minimize fugitive dust, and maintain surface compaction. Existing water holes, and other sites such as ponds, lakes, or streams, used for water drafting would be inspected by a fisheries biologist or hydrologist for existing amphibians and flow levels prior to use. A Forest Service approved screen covered drafting box, or other device to create a low entry velocity (RCO #4, SNFP ROD p. A-56), would be used while drafting to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats. Drafting would be from the deepest water source, near the bottom. The fisheries biologist would be notified if any type of water additive would be applied to roads.

Skid Trails - The project administrator would approve skid trail systems in each unit. Existing skid trails would be used if appropriate, to limit the extent of additional soil compaction. Erosion control measures would be constructed after completing operations in each unit. Skid roads and landings would be ripped or subsoiled, and/or mulched with slash or weed free straw, to alleviate soil compaction and erosion problems, restore infiltration, and discourage OHV use. Culverts would be assessed for proper functioning prior to road closures.

The transportation analysis and road closure plan identified seven roads that should be closed to travel (maintenance level 1), but are currently open to vehicle traffic. These roads would be

stabilized by waterbarring or other erosion control measures to assure proper drainage, and closed to vehicle traffic by gates, guardrail barricades, boulders and/or obliteration.

Table 1. Roads proposed for closure in the project area

Road Designator	Current Status	Proposed Status	Method of Closure	Coordinating Requirements
9N57	Open	Closed	2 Gates	Remove gates on 9N57A & 9N57B
9N57A	Closed	Decommission	Berm	Replace gate with berm
9N57B	Closed	Decommission	Berm	Replace gate with berm
9N59B	Open	Decommission	Berm	
9N61A	Closed	Decommission	Gate	Decommission after project
9N73B	Open	Decommission	Gate	Decommission portion of road behind gate
9N73C	Open	Decommission	Berm	

Two waterholes would be reconstructed: Waterhole located off 9N57 – rehabilitate the spring adjacent to the waterhole, restore the stream channel above, adjacent, and below the waterhole, install an outlet in the waterhole, rock the loading pad, and install a barrier near the stream channel to prevent vehicle entry.

Drafting site on the Steely Fork of the Cosumnes (located off 9N59) – obliterate the portion of the road north of the Steely Fork that is on the National Forest; barricade either end of the road; remove the cement crossing at the drafting site; restrict vehicle access at the drafting site and parking area next to the river.

V. SPECIES ACCOUNTS

Within the 2003 Last Chance Fuels Reduction Project area there are several types of aquatic habitats including streams, springs, and seeps. Steeley Fork Cosumnes River, Clear Creek, Dogtown Creek, Shingle Mill Gulch, and two ponds on private property. The project units are located between approximately 3,040 and 4,760 feet in elevation.

The following table (Table 2) lists those species introduced in Section II, their preferred habitats, and whether, based on the activities the project proposes, the species has the potential of being impacted by any of the proposed projects. Species that may be impacted by the activities proposed under this project are shown in shaded type below.

Table 2. Threatened, endangered, candidate, or sensitive aquatic species that may be present in Eldorado National Forest

Species	TES Status	Elevation Range of Habitat (ft)	Preferred Habitat	Potential for Project to Affect this Species
California red-legged frog and critical habitat	threatened	Below 5,000	Ponds and slow-moving streams	None. All treatment units lie below 5,000 feet in elevation, therefore, CRLF surveys were conducted in suitable habitat according to U.S. Fish and Wildlife Service survey protocol.
Central Valley spring-run chinook	threatened	N/A	Central Valley delta and up rivers to man-made and natural barriers	None. BMPs will prevent adverse effects downstream.
Central Valley steelhead	threatened	N/A	Central Valley delta and up rivers to man-made and natural barriers	None. BMPs will prevent adverse effects downstream.

delta smelt	threatened	N/A	Sacramento-San Joaquin delta	None. BMPs will prevent adverse effects downstream.
foothill yellow-legged frog	FS sensitive	Below 6,000	High gradient streams with cobbles, riffles, and open areas	Suitable habitat exists within the project area. No FYLF were observed during amphibian surveys within project area.
hardhead	FS sensitive	30-4,800	Sacramento-San Joaquin delta, S. Fork American River	None. BMPs will prevent adverse effects downstream.
Lahontan cutthroat trout	threatened	N/A	High elevation and east slope streams and lakes	None. No known populations have the potential to be affected by the proposed project.
mountain yellow-legged frog	FS sensitive	Above 5,000	High elevation low-gradient streams and small ponds	None. No known populations have the potential to be affected by the proposed project. Outside their range.
northern leopard frog	FS sensitive	From sea level-7,000	Perennial streams and ponds	None. Incidental historical occurrence for this species on Forest at Riverton and off-Forest in the Lake Tahoe Basin.
western pond turtle	FS sensitive	Below 5,000	Ponds and slow moving streams	Suitable habitat may exist within the project area. No turtles were seen during CRLF surveys. One individual had been sighted in Leoni Meadows swimming pond.
Sacramento splittail	threatened	N/A	Backwaters of Sacramento-San Joaquin delta system	None. BMPs will prevent adverse effects downstream.
Sacramento winter-run chinook	endangered	N/A	Central Valley delta and up rivers to man-made and natural barriers	None. BMPs will prevent adverse effects downstream.
Yosemite toad	FS sensitive	Above 6,400	High elevation wetland areas and meadows	None. No known populations have the potential to be affected by the proposed project. Outside their range.

California Red-legged Frog

Species and Habitat Account

The species and habitat account for the California red-legged frog (CRLF) is found in Appendix C.

Existing surveys and sightings: There has been one known occurrence of this species on the Eldorado National Forest approximately twenty-seven miles north of this project area. On June 18, 2001, one female was detected in a pond on Ralston Ridge between Rubicon River and Middle Fork American River along a powerline transmission corridor. Previous sightings have confirmed CRLF in the North Fork Weber Creek drainage on Bureau of Land Management land. Here egg masses and adults have been detected in Spivey Pond in 1998 to 2002. This pond is approximately 8.5 miles northwest of the closest stand in the Last Chance area, Stand #544.

In 2001 and 2002, surveys for CRLF occurred within and near the project area to assess occupancy of CRLF. Low gradient streams (less than 4% gradient) and ponds within one mile of

the project boundary were considered suitable habitat. Low gradient stream reaches were identified in USDI (2001) as aquatic habitat necessary to sustain all life stages of CRLF. Low gradient stream reaches are defined as being below 2%, according to Rosgen (1996), but we also surveyed stream reaches up to 4% gradient. All project stands lie below 5,000 feet in elevation, in the range of CRLF. The GIS analysis of existing waterbodies determined four known ponds within a mile from the project stands. Four are on private property. (T9N, R13E, Sec. 26) . The GIS analysis for low gradient streams (below 4%) within a mile of the project boundary resulted with reaches on Clear Creek, Dogtown Creek, Shingle Mill Gulch, and Steely Fork Cosumnes River. These four ponds and low gradient stream reaches were considered possible suitable habitat for CRLF.

To further determine habitat suitability, the stream locations were surveyed for CRLF habitat using the "CRLF Breeding Habitat Suitability Determination" protocol, developed by ENF biologists in 2001. This protocol assesses whether the following key breeding habitat components, as described in the "Final Determinations of Critical Habitat for the California Red-legged; Final Rule" (USDI 2001), are present: slow moving water in pools with a minimum water depth of at least 0.5 m and egg brace sites for egg attachment. Pool depths over 0.5 meters are suitable for reproduction (USDI 2001, pg 14642). Reproductive habitat in these streams was determined by: walking the lowest gradient sections, measuring pool depth, photographing possible egg brace sites, and measuring the velocity of water at the egg brace sites. Results of these surveys are shown on Table 3. It was determined that Shingle Mill Gulch, Clear Creek and Dogtown Creek do have sections that could provide possible breeding habitat for CRLF, especially in side channel and calm backwater areas of the main channels. The Steeley Fork Cosumnes River was determined not to be suitable breeding habitat because it increases in flow from snow melt in late spring. It does not provide breeding habitat because still or slack water utilized for egg deposition is not available during the breeding season due to the high flow of water, as described in USDI (2002).

The stream sections with suitable breeding habitat were surveyed to USFWS protocol (USDI 1997), with two day time and two nighttime surveys (Table 3). Surveyed sections have been mapped (See the EA). Both ponds were surveyed, after permission was obtained from the landowner (Table 3). One pond was surveyed during the day and night; it had a heavy infestation of bullfrogs (*Rana catesbeiana*), thus was determined unsuitable for California red-legged frogs. Therefore the other two surveys were not completed. The other Leoni Meadow pond (the one in the stream) was surveyed with two day and two night time surveys. The two ponds in Section 15 are also on private property with different owners and permission to survey was not able to be obtained. If those ponds did have CRLF, they are within 1.25 miles of dispersal distance to Steeley Fork Cosumnes River, although this river has been determined not to be suitable breeding habitat, for reasons stated above. The USFWS determined the 1.25 miles to be a distance that CRLF will travel between two suitable breeding sites (USDI 2001). Since Steely Fork Cosumnes River is not suitable habitat, even if the ponds have CRLF, it is not likely they would be moving between these waterbodies. Also, this movement would be to the stream but not across a unit area, as the nearest unit lies on the other side of the stream from the ponds. All survey protocols and results on survey forms can be found in the project file.

North State Resources, Inc. surveyed for amphibians related to suction dredge monitoring on May 17, 2002. They surveyed approximately 300 feet of Clear Creek and a mile of Steeley Fork Cosumnes River, in the vicinity of the project areas, but did not see frogs (North State Resources, Inc. 2002). Other previous surveys occurred on Steely Fork Cosumnes River in 1992, 1993, and 1998. Dogtown Creek was surveyed to USFWS protocol (USDI 1997) in 2002 (USDA 2002) approximately four miles upstream from project units/stands.

Table 3. Red-legged Frog Surveys showing those stream reaches surveyed to ENF habitat protocol and USFWS protocol (USDI 1997)

Stream Name	Survey Dates	Length of stream surveyed (ft.)	Suitable Habitat?	Species Observed
Clear Creek - East of Leoni Meadows	10/17/02	230	N	None
Clear Creek - Last Chance Mine	6/25/02 6/26/02 9/23/02 9/24/02	3748	Y	Western aquatic garter snake, Trout.
Clear Creek Leoni House Pond	10/24/02 10/28/02	Pond	Y but determined unsuitable due to many bullfrogs	Bullfrogs and treefrogs
Clear Creek - Main Branch through Leoni Meadows and other pond	10/22/02 10/24/02 10/26/02 10/28/02 10/30/02	6150	Y	Trout (dead)
Clear Creek - North Fork through Leoni Meadows	10/24/02	2565	N	None
Clear Creek - West of Gould Meadow	10/17/02	1870	N	None
Dogtown Creek – Near Little Mountain	10/20/02 10/26/02 10/28/02 10/30/02	4145	Y	Trout (dead and live)
Shingle Mill Gulch	10/17/02 10/26/02 10/28/02 10/30/02	2640	Y	None
Steeley Fork Cosumnes River	4/25/01	1617	N	None

Direct and Indirect Effects

Perennial stream buffers (RCAs) of 300 feet along Steeley Fork Cosumnes River and Clear Creek would be applied to the project area where no mechanical equipment would be entering. Along ephemeral and intermittent streams the buffer from mechanical equipment would be 50 feet. The risk of sediment introduction to the stream by the use of heavy machinery is minimized by implementing the Best Management Practices (USDA 2000) shown in Table 4. These RCA buffer strips would be the areas most likely to have frogs if CRLF actually resided or dispersed through the area. As a result of thorough surveying (Table 3) to USFWS protocol (USDI 1997) there would be no need for a limited operating period during their dispersal period. It is not likely that any California red-legged frogs live near the project areas, as these past surveys have indicated.

Table 4. Applicable Best Management Practices to this project.

Practice #	Protection Measure
1-8	Streamside Management Zone Designation
1-19	Stream course and Aquatic Protection
5-1	Soil Disturbing Treatments on the Contour
5-2	Slope Limitations for Mechanical Equipment Operation
5-3	Tractor Operation Limitation in Wetlands and Meadows
5-5	Disposal of Organic Debris
5-6	Soil Moisture Limitations for Mechanical Equipment Operations
6-2	Consideration of Water Quality in Formulating Fire Prescriptions
6-3	Protection of Water Quality from Prescribed Burning Effects
7-4	Forest and Hazardous Substance Soil Prevention Control and Countermeasure Plan (plan not necessary but need to park vehicles at least 50 feet away from a stream course when at a landing or stream crossing)

Under-burning prescription parameters would ensure a cool and controlled flame length less than 4 feet. Ignition would occur outside the RCA and be allowed to backburn naturally down the streamside area without re-igniting. This reduces the chance of the fire escaping down through the riparian area below which would increase sedimentation in the future and cause a loss of aquatic habitat for species. Any hand lines constructed to control the fire in the RCA would be covered with debris and needle cast to prevent erosion after use .Several years of best management practices monitoring on prescribed fire projects indicate that ground cover objectives are being met and prescribed fires have been under control.

Hand thinning and pruning may occur in units inside the RCA. Buffers for piles would be 300' for perennial and 50' for intermittent and ephemeral streams. This would prevent sediment getting into stream due to erosion; applicable BMPs would protect stream course from sediment. No riparian trees, such as bigleaf maples, dogwood, hazelnut, aspen, cottonwood, alder, or willow would be pruned or cut. California red-legged frogs may use piles for cover, as their summer habitat may include organic debris and downed trees or logs when they disperse from the water (USDI 2002). As a result of surveys performed to U.S. Fish and Wildlife Service protocol, it can be concluded that CRLF do not reside in the area. There is no need for limited operation periods because no CRLF were found.

Existing water holes and other sites such as ponds, lakes, or streams, used for water drafting would be inspected by a fisheries biologist or hydrologist for existing amphibians and flow levels prior to use. A Forest Service approved screen covered drafting box, or other device to create a low entry velocity (RCO #4, SNFP ROD p. A-56), would be used while drafting to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats. Drafting would be from the deepest water source, near the bottom. The fisheries biologist would be notified if any type of water additive would be applied to roads.

Road maintenance work, such as brushing and grading roads, can be ground disturbing, and may affect riparian vegetation if in the RCA, although this vegetation would already be highly affected by the proximity of the road. Ground disturbance for road maintenance would be beneficial in that the grading would be creating appropriate, frequent drainage locations to reduce large gullied runoff spots that may run to a stream course.

Some existing landings would be reused; these may lie in the RCA. After use, the landings would be scarified, shaped, and ditched as needed to minimize soil displacement to the streams. They would be revegetated and replanted. In the future they would heal and blend in with the landscape and contribute to the health of the riparian corridor. During use, waterbars would be placed to prevent rilling and gullying of water that may lead to a stream course.

Six roads would be decommissioned and 2 waterholes would be reconstructed. This may involve ripping and re-contouring roads which lie primarily in the RCAs. The effects of this work may be a short duration of sedimentation resulting with less sedimentation long term. It is unlikely that the road decommissioning would increase sedimentation with the use of BMPs, waterbars, and weed-free straw when necessary to eliminate runoff during and after heavy equipment work. The waterhole reconstruction and removal of the cement platform used for crossing the Steeley Fork Cosumnes may stir up fines and substrates in the water, causing turbid water quality for a short period of time immediately downstream. This turbidity, if excessive, could cover CRLF eggs and tadpoles, but it has been determined by surveying that CRLF do not live in Steeley Fork Cosumnes River, as stated above in "Existing surveys and sightings". Equipment near the stream could crush CRLF if they were there. Adequate surveys of the project area determined their lack of presence; therefore they would not be affected.

Cumulative Effects

Generally, when surveys determine that no CRLF live in the vicinity of a project area, then cumulative effects for that species would not need to be considered. Since there is suitable habitat in the areas of the project, it would be beneficial to discuss the past or present reasons or conditions that may have affected the species and possibly caused their demise in this area. It is unknown whether any individuals ever resided in the area. The Cosumnes River area is considered a recovery area for this species (USDI 2002), and future introductions may be considered by the USFWS.

The actions taken by this project are not expected to produce cumulative effects. By following BMP guidelines (USDA 2000) and by applying RCA buffer widths in the areas proposed, there are no expected cumulative effects as a result of actions taken by this project. By reducing the risk of a catastrophic wildfire and improving forest health, future cumulative effects on a large scale are being avoided. Restoration work to existing roads and waterholes would help enhance recovery of Steeley Fork Cosumnes River. Roads are considered the principal cause of accelerated erosion in forests throughout the western United States (USDA 2000), and average road densities are high in the project area. Work to reduce roads is a step toward reducing cumulative effects. The original construction and existence of roads may have led to CRLF habitat degradation by sedimentation and easier access by the public. Dispersed recreation activities near or in streams could disturb TES aquatic species through removal of riparian vegetation or the accumulation of sediment. Tadpoles and frogs could be affected from collection or disturbance by people. The level of use across the forest is expected to continue and increase over time as the human population continues to increase, although the goal of the ROD (USDA 2001b) is to reduce the number of roads in RCAs.

Indiscriminate planting of bullfrogs in private ponds, and the colonization of bullfrogs to neighboring ponds, could have caused the elimination of the California red-legged frog in the ponds surrounding the project area.

On a worldwide basis, acid precipitation, ultraviolet radiation, viruses, pesticides, habitat destruction, and global climate change have all been suggested as causes for the decline of amphibians (Carey 1993). Increased isolation of threatened frog populations may also have significantly reduced the probability of re-colonization of a site where extinction occurred (Wilcox 1980, Hanski and Gilpin 1991). This effect could occur due to the decreased size of potential source populations, the increased distance from source populations, and direct predation on dispersing individuals (Hanski 1989, Sjogren 1991).

A request letter dated October 21, 2002 to the Fresno office of California Department of Forestry resulted with some recent and planned timber harvest plans on private lands in the watersheds where this project is located (Table 5)(USDA 2003). In order to summarize the more significant

projects for cumulative effects, private and USFS projects causing land disturbance implemented since 1999 are listed, as well as projects between 1990-1999 with acreage above 100. All historic projects for all years that added land disturbance cumulative watershed effects are in the hydrology report associated with this project (USDA 2003). Table 5 shows land disturbance affecting the entire watershed areas. These would not necessarily have a localized effect on the area of the project. Any land disturbance affecting the stream corridor upstream from the streams of the project may possibly contribute to cumulative effects.

Table 5. Projects with land disturbance in the watersheds of this project implemented since 1999 and projects between 1990-1999 with acreage above 100

Watershed	Year	Acres	Ownership
Lower Steeley Fork Cosumnes	2000	33	USFS - Ridgerunner herbicides
	1999	40	USFS – Lincoln Log thin and group select
	1999	10	USFS – Lincoln Log site prep
	1994	100	Kozycz
	1993	350	Tyler
Lower Lower Middle Fork Cosumnes	2001	46	USFS – Ridgerunner thin
	2001	89	USFS – Ridgerunner herbicides
	1997	125	Wetsel-Oviatt
	1991	850	USFS salvage
Clear Creek	2001	347	USFS – Ridgerunner thin/biomass
	2002	38	USFS – Ridgerunner site prep
	2000	139	USFS – Nelly CTL
	2000	90	Leoni Mdw
	2000	3	USFS – Tie Die 2R
	2000	261	USFS - Ridgerunner herbicides
	1999	29	USFS – Tie Die 2R
	1991	120	USFS – Plummer fuelbreak
Upper Steeley Fork Cosumnes	2001-2002	812	USFS – Ridgerunner thin/biomass
	2002	362	USFS – Tie Die Unit 1R handcut/TP
	2001	39	USFS – Ridgerunner herbicides
	2001	25	USFS- 2nd Fiddle timber removal
	2001	5	USFS- 2nd Fiddle site prep
	2001	15	USFS – 623-15 Steely Dog
	1999	493	USFS – Tie Die Unit 1R
	1999	141	USFS – Lincoln Log
	1995	210	USFS – Roadside hazard
	1992	100	USFS – Salvage-Halfshot
	1991-1992	346	USFS – Insecta-correcta
	1990	162	USFS - Railroad
Dogtown Creek	2002	310	USFS - Ridgerunner thin/biomass
	2002	155	USFS – Tie Die handcut/tr pile
	2002	53	USFS – masticate 624-53
	2002	54	USFS – Tie Die Rx Burn
	2002	15	USFS – Nelly Rx Burn
	2001	49	USFS – masticate 624-49
	2001	278	USFS – masticate 624-1-11,13-16,19, 22-23
	2001	82	USFS - Ridgerunner thin
	2000-2001	152	USFS - Tie Die thin
	2000	280	Leoni Mdw
	1999	30	USFS – Capps B&C
	1999	32	USFS - LMF Cosumnes

Future known projects to be implemented in 2003-2007 are the Plantation Protection Project, Ridgerunner Prescribed burning, Lincoln Log Rx burn, Simpson Prescribed Burn, and Clear Plantation Fuels Reduction, all USFS projects. These are described in the cumulative watershed supplements for the project watersheds (USDA 2003).

The majority of activities in Table 5 are USFS projects. During the last decade protective measures for streamside zones have become more and more restrictive. Although timber harvest plans on private land during the last decade have had stream buffer requirements that protect the streams, the intensity and size of these activities on private land vary, but in many cases result in fragmentation of habitat for many species. Often these activities decrease and degrade the amount of aquatic suitable habitat, making National Forest lands increasingly important for these species. Any timber activities being planned in the future by the USFS will follow the standards and guidelines established under the Sierra Nevada Forest Plan Amendment. The effects of all of these sales in the project area would promote the growth of larger trees that would eventually contribute large down woody debris to the RCAs sooner. Stream buffers and LOPs are provided to assure protection from sedimentation or effects from crushing.

Conclusions: Combining all the cumulative effects from other activities in the watersheds of the project area over time may possibly have contributed to the present non-status of the species in localized stream populations. Roads were probably the single most significant factor that caused stream habitat degredation. The access to the public, and the introduction of bullfrogs were probably the next most significant factors causing their possible demise, if they ever resided in the area. Historic land treatments caused habitat degredation by sedimentation and loss of riparian vegetation that may have affected CRLF, some of which has recovered over time. Treatments in the last ten years on National Forest lands have become protective of the stream course with buffers and water quality BMPs. Effects to aquatic and riparian habitats are assumed to be greater under private management than under National Forest ownership and are likely to have more intensive treatments resulting in greater ground disturbance and smaller streamside buffers. Future USFS protection and restoration measures in the RCAs, provided by the Framework decision, would help improve the habitat and water quality of these watersheds.

Summary

Adequate survey coverage has indicated that no California red-legged frogs live in the project vicinity that may be affected by these project activities. Therefore, activities by heavy equipment would not crush individuals. The project would reduce sedimentation to waterways in the long-term, although short term sedimentation may occur by the restoration work. The fuels project work has been adequately designed to eliminate damage to aquatic species habitat in the riparian corridor. Maintenance and improvement of the aquatic habitat is expected over the long term by reducing the potential for large wildfires with this fuels treatment project and obliterating six roads.

Determination of Effects

It is my determination that this project would have no effect on the California red-legged frog or its habitat.

Foothill Yellow-legged Frog

Species and Habitat Account

The species accounts for foothill yellow-legged frogs can be read in Appendix C.

Existing surveys and sightings: Most all creeks below 6,000 feet elevation have the potential to have foothill yellow-legged frogs (FYLF), as this species was common in the Sierra Nevada mountains historically. The nearest known sighting of a FYLF to the Last Chance Fuels

Reduction Project was in 1994 in Sopiago Creek about one mile away, across Dogtown watershed, to the south. No other sightings are within a reasonable distance to the project.

Clear Creek, Steeley Fork Cosumnes River, sections upstream of Leoni Meadows, Dogtown Creek, Shingle Mill Gulch, and ponds have been surveyed for California red-legged frogs and other amphibians (Table 3) in 2002. No foothill yellow-legged frogs or their life stages were observed in these stretches. However, during suction dredge monitoring, North State Resources, Inc. (NSR) observed one frog approximately 2.5 miles upstream from the nearest Last Chance Fuels Reduction Project treatment stand (#77 or #79) in Dogtown Creek on May 18, 2002. This frog sighting was suspected of being a foothill yellow-legged frog, because it plopped into the water to escape, but the frog was not captured and could not be positively identified. North State Resources, Inc. also surveyed approximately 300 feet of Clear Creek and a mile of Steeley Fork Cosumnes River on May 17, 2002 but did not see frogs (North State Resources, Inc. 2002). Other previous surveys occurred on Steely Fork Cosumnes River in 1992, 1993, and 1998. The streams in the project area are suitable habitat for FYLF.

Direct and Indirect Effects

Streamside buffers (with RCA widths as stated in the description of the proposed action) along perennial and intermittent streams and their tributaries would be applied to the project area, where no mechanical equipment would be entering. These buffers are 300 feet on perennial streams and 50 feet on intermittent and ephemeral streams. Foothill yellow-legged frogs are most likely to reside in the perennial streams where the wider buffers are, but may use intermittent streams for connectivity traveling from one location to another. Since foothill yellow-legged frogs have not been known to travel away from the stream course itself, these RCA buffer areas would be their best protection if they exist in streams nearby. The risk of sediment introduction to the stream by the use of heavy machinery is further minimized by implementing the Best Management Practices (USDA 2000) shown in Table 4.

Hand thinning and pruning may occur in plantation units inside the RCA. Buffers for piles will be 300' for perennial and 50' for intermittent streams. These buffers would prevent sediment getting into stream due to erosion (applicable BMPs would protect stream course from sediment). There is no scientific data to show foothill yellow-legged frogs reside in piles of debris. No riparian trees would be pruned or cut, such as bigleaf maples, dogwood, hazelnut, aspen, cottonwood, alder, or willow.

Under-burning prescription parameters would ensure a cool and controlled flame length less than 4 feet. Ignition would occur outside the RCA and be allowed to backburn naturally down the streamside area without re-igniting. This reduces the chance of the fire escaping down through the riparian area below which would increase sedimentation in the future and cause a loss of aquatic habitat for species. Any hand lines constructed to control the fire in the RCA would be covered with debris and needle cast to prevent erosion after use. Several years of best management practices monitoring on prescribed fire projects indicate that ground cover objectives are being met and prescribed fires have been under control.

Existing water holes and other sites such as ponds, lakes, or streams, used for water drafting would be inspected by a fisheries biologist or hydrologist for existing amphibians and flow levels prior to use. A Forest Service approved screen covered drafting box, or other device to create a low entry velocity (RCO #4, SNFP ROD p. A-56), would be used while drafting to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats. Drafting would be from the deepest water source, near the bottom. The fisheries biologist would be notified if any type of water additive would be applied to roads.

Road maintenance work, such as brushing and grading roads, can be ground disturbing, and may affect riparian vegetation if in the RCA, although this vegetation would already be highly affected by the proximity of the road. Ground disturbance would be beneficial in that the grading would be creating appropriate, frequent drainage locations to reduce large gullied runoff spots that may run to a stream course.

Some existing landings would be reused; these may lie in the RCA. After use, the landings would be scarified, shaped, and ditched as needed to minimize soil displacement to the streams. They would be revegetated and replanted. In the future they would heal and blend in with the landscape and contribute to the health of the riparian corridor. During use, waterbars would be placed to prevent rilling and gullying of water that may lead to a stream course.

Six roads would be decommissioned and 2 waterholes would be reconstructed. This may involve ripping and re-contouring roads which lie primarily in the RCAs. The effects of this work may be sedimentation of a short duration with less sedimentation long-term. Excessive sedimentation in the stream could cover egg masses downstream causing lack of oxygen. With the use of BMPs, waterbars, and weed-free straw to eliminate runoff during and after the heavy equipment work, it is unlikely that the road decommissioning would increase sedimentation. The waterhole reconstruction and removal of the cement platform used for crossing the Steeley Fork Cosumnes may stir up fines and substrates under water, causing turbidity temporarily immediately downstream. Equipment near the stream could crush FYLF if they were there, especially with the removal of the cement platform and the heavy equipment work near the waterholes. These areas near the stream would be surveyed for FYLF and any life stages prior to beginning heavy equipment work.

Cumulative Effects

The actions taken by this project are not expected to produce cumulative effects. By following BMP guidelines (USDA 2000) and by applying RCA buffer widths in the areas proposed, there are no expected cumulative effects as a result of actions taken by this project. By reducing the risk of a catastrophic wildfire and improving forest health, future cumulative effects on a large scale will be avoided. Restoration work to existing roads and waterholes would help enhance recovery of Steeley Fork Cosumnes River. Roads are considered the principal cause of accelerated erosion in forests throughout the western United States (USDA 2001b), and average road densities are high in the project area. Work to reduce roads is a step toward reducing cumulative effects. The original construction and existence of roads may have led to FYLF habitat degredation by sedimentation and easier access by the public. Dispersed recreation activities near or in streams could disturb TES aquatic species through removal of riparian vegetation or the accumulation of sediment. Tadpoles and frogs could be affected from collection or disturbance by people. The level of use across the forest is expected to continue and increase over time as the human population continues to increase, although the goal is to reduce the number of roads in RCAs.

On a worldwide basis, acid precipitation, ultraviolet radiation, viruses, pesticides, habitat destruction, and global climate change have all been suggested as causes for the decline of amphibians (Carey 1993). Increased isolation of threatened frog populations may also have significantly reduced the probability of re-colonization of a site where extinction occurred (Wilcox 1980, Hanski and Gilpin 1991). This effect could occur due to the decreased size of potential source populations, the increased distance from source populations, and direct predation on dispersing individuals (Hanski 1989, Sjogren 1991).

A request letter dated October 21, 2002 to the Fresno office of California Department of Forestry resulted with some recent and planned timber harvest plans on private lands in the watersheds where this project is located (Table 5)(USDA 2003). In order to summarize the more significant

projects for cumulative effects, private and USFS projects causing land disturbance implemented since 1999 are listed, as well as projects between 1990-1999 with acreage above 100. All historic projects for all years that added land disturbance cumulative watershed effects are in the hydrology report associated with this project (USDA 2003). Table 5 shows land disturbance affecting the entire watershed areas. These would not necessarily have a localized effect on the area of the project. Any land disturbance affecting the stream corridor upstream from the streams of the project may possibly contribute to cumulative effects.

The majority of activities in Table 5 are USFS projects. During the last decade protective measures for streamside zones have become more and more restrictive. Although timber harvest plans on private land during the last decade have had stream buffer requirements that protect the streams, the intensity and size of these activities on private land vary, but in many cases result in fragmentation of habitat for many species. Often these activities decrease and degrade the amount of aquatic suitable habitat, making National Forest lands increasingly important for these species. Any timber activities being planned in the future by the USFS will follow the standards and guidelines established under the Sierra Nevada Forest Plan Amendment. The effects of all of these sales in the project area would promote the growth of larger trees that would eventually contribute large down woody debris to the RCAs sooner. Stream buffers are provided to assure protection from sedimentation or effects from crushing.

Future known projects to be implemented in 2003-2007 are the Plantation Protection Project, Ridgerunner Prescribed burning, Lincoln Log Rx burn, Simpson Prescribed Burn, and Clear Plantation Fuels Reduction, all USFS projects. These are described in the cumulative watershed supplements for the project watersheds (USDA 2003).

Conclusions: Combining all the cumulative effects from other activities in the watersheds of the project area over time may possibly have contributed to the present low population status of the species in localized stream populations. Roads were probably the one most significant factor that caused stream habitat degradation. Historic land treatments caused habitat degradation by sedimentation and loss of riparian vegetation that may have affected FYLF, some of which has recovered over time. Treatments in the last ten years on National Forest lands have been more protective of the stream course with buffers and water quality BMPs. Effects to aquatic and riparian habitats are assumed to be greater under private management than under National Forest ownership and are likely to have more intensive treatments resulting in greater ground disturbance and smaller streamside buffers. Future USFS protection and restoration measures in the RCAs, such as road obliteration, as provided by the Framework decision, would help improve the habitat and water quality of these watersheds.

Summary

Habitat for FYLF exists in the project area, primarily in the perennial streams, although FYLF have not been observed in these streams in the project area. This project would reduce sedimentation to waterways in the long-term, although short-term sedimentation may occur from the restoration work. Effects to FYLF and their life stages could occur by being crushed with heavy equipment during the restoration work of the waterholes and removal of the cement stream crossing. The areas restored would be surveyed prior to the work to prevent this possibility. Excessive sedimentation could cover egg masses and tadpoles from the in-stream restoration work, but it is highly unlikely that FYLF would be reproducing in Steeley Fork Cosumnes River. The fuels project work has been adequately designed to eliminate effects to aquatic species habitat in the riparian corridor. It is unlikely for there to be any breeding populations of FYLF in the area; past surveys showed no positive detections. Rather, it is more probable that individuals may use the stream for connectivity traveling through the area to other breeding sites.

Maintenance and improvement of the aquatic habitat is expected over the long term by reducing the potential for large wildfires with this fuels treatment project. Since foothill yellow-legged frogs have not been known to travel away from the stream course, the provided stream buffer areas would be their best protection if they exist here.

Determination of Effects

It is my determination that this project may impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability for the foothill yellow-legged frog.

Western Pond Turtle

Species and Habitat Account

The species accounts for western pond turtle are found in Appendix C.

Existing surveys and sightings: Western pond turtles are habitat generalists, occurring in a wide variety of permanent and intermittent aquatic habitats. They do prefer to have pools nearby to escape from predators and basking sites such as large logs and boulders. Most populations currently exist in smaller streams, usually in montane areas. Their habitat needs can be varied, thus they are not restricted to any certain type of habitat, and basically could be potentially found in most streams below 5,000 feet in elevation. Nesting and over-wintering habitat for western pond turtles exist in the project area.

Closest past sightings of western pond turtles of the project stands were along Clear Creek in April, 1995. A western pond turtle was seen in the pond in Clear Creek (Table 4). This sighting would have been approximately 3390 feet from stand #3275 and approximately 3800 feet from stand #3227. In 1997 one western pond turtle was seen in Sopiago Creek approximately two miles south of the project area, across Dogtown watershed. In 2002 another western pond turtle was seen in Camp Creek over seven miles from the project area. Individuals (usually males) may have large home ranges and may wander within a given watercourse for several km on a regular basis (Reese 1996).

Their nests could be quite some distance from the stream (500 m) (Holland 1994) where a sunny exposure in an open area is hitting the hillslope in a generally south facing aspect. These sites usually have sandy loose-type soil, although nest locations are not restricted to that. A plantation or skid road may be an ideal location for a western pond turtle to lay its eggs, especially those located on south facing slopes. The majority of nest sites have been found on dry, well drained soils with significant clay/silt content and low (<15 degree) slope. Most have been in open areas dominated by grasses or herbaceous annuals, with few shrubs or trees in the immediate vicinity. A GIS query on south and south-west facing slopes with a slope of less than 15 degrees was performed in the Last Chance Fuels Reduction Project area. The following stands lie within this range with portions that lie within 500 meters of perennial watercourses and should be considered suitable nesting habitat: 3148, 3228, 3231, 3246, 3254, 3277, 3300, 3301, 3302, 3303, 3616. The previous western pond turtle sighting in the pond in Clear Creek has suitable nesting habitat within 500 meters to the north. The nearest project unit to that nesting habitat is Unit 3275, which is 1,140 meters to the north of the pond and beyond the suitable nesting habitat, in unsuitable nesting habitat.

Direct and Indirect Effects

Streamside buffers (with widths as stated in the description of the proposed action) along perennial and intermittent streams and their tributaries would be applied to the project area, where no mechanical equipment would be entering. This buffer would prevent sedimentation of the streams, thus filling pools, decreasing their depth over time and restricting an important habitat element for western pond turtles. The risk of sediment introduction to the stream by the use of

heavy machinery is minimized by implementing the Best Management Practices (USDA 2000) shown in Table 4.

These buffers would not prevent crushing of individual turtles or their nests in the fuels reduction areas. Most nests are within 100 m from water (Holland 2001), although nests could be as far as 500 m from the stream (Holland 1994). Nests outside of the stream buffer may be crushed by mastication machinery when western pond turtles travel overland to lay their eggs in May to July. In the event that turtles are found to occupy these areas, direct adverse effects could occur.

Due to the need for more research data on this species, it is difficult to determine what effects, if any, the proposed project may have on the western pond turtle. In areas that receive compaction by heavy equipment in the lower duff and upper soil layers, potential nests could be crushed. Generally, mastication equipment is light on the land with low impact, dropping organic material as ground cover, and then driving over that material. A nest underneath this treatment may or may not be affected. The project units/stands are not near the most likely nesting locations and not within 500 meters of the pond sighting in 1995.

Under-burning may or may not affect eggs or young still in the nest. Under-burning prescription parameters would ensure a cool and controlled flame length less than 4 feet. If the turtle nests are present in the under-burned area, they may or may not be affected by the fire above ground or by the creation of handlines. Emerging hatchlings or adults passing through the stands of the Last Chance Fuels Reduction Project area could be burned. As stated above the most likely location of western pond turtle nests would be within 500 meters of the past adult sighting in the pond. There is likely nesting habitat within 500 meters north of the pond, according to the GIS query. There are no project units located in that area.

Several years of best management practices monitoring on past prescribed fire projects indicate that ground cover objectives are being met and prescribed fires have been under control. Ignition would occur outside the RCA and be allowed to backburn naturally down the streamside area without re-igniting. This reduces the chance of the fire escaping down through the riparian area below which would increase sedimentation in the future and cause a loss of aquatic habitat for species. Any hand lines constructed to control the fire in the RCA would be covered with debris and needle cast to prevent erosion after use.

There may be beneficial effects through fuels reduction, thinning, and mastication by 1) opening up previously vegetated areas and exposing more soil to solar radiation for nesting, and by, 2) providing access for western pond turtle migration through areas that used to have brush and thickets.

Road maintenance work, such as brushing and grading roads, can be ground disturbing, and could crush turtles if they are traveling overland in the area of the road work. The reuse of existing landings by heavy machinery, which may lie in the RCA, could also crush individuals traveling through. These scenarios are highly unlikely, though. After use, the landings would be scarified, shaped, and ditched as needed to minimize soil displacement to the streams. They would be revegetated and replanted. In the future they would heal and blend in with the landscape and contribute to the health of the riparian corridor.

Six roads would be decommissioned and 2 waterholes would be reconstructed. This may involve ripping and re-contouring roads which lie primarily in the RCAs. The use of heavy machinery near the stream courses could also possibly crush turtles traveling through. The most likely time for these western pond turtle movements is during early spring and late fall and may represent movements from and to upland over-wintering sites. Western pond turtles may travel considerable distances (up to 5 km) between watercourses, although most animals appear to

remain within a given watercourse for extended periods of time, up to several years to over a decade (Holland 2001).

Cumulative Effects

Roads are considered the principal cause of accelerated erosion in forests throughout the western United States (USDA 2001b), and average road densities are high in the project area. Excessive erosion to stream fills pools, reducing the habitat for western pond turtles. An increase in the density of roads is an increase in the chance for western pond turtles to be run over by vehicles (Gibbs 2002). Work to reduce roads is a step toward reducing cumulative effects. The original construction and existence of roads may have led to western pond turtle habitat degredation by sedimentation and easier access by the public.

Dispersed recreation activities near or in streams could disturb TES aquatic species through the accumulation of sediment which fills pools, collected or handled by people, or disturbed by pets. Indiscriminate planting of bullfrogs in private ponds, and the colonization of bullfrogs to neighboring ponds, affects the western pond turtles in a detrimental way (Holland 2001). The level of use across the forest is expected to continue and increase over time as the human population continues to increase, although one restoration goal of the Riparian Conservation Objectives (USDA 2000a) is to reduce the number of roads in RCAs.

By following BMP guidelines (USDA 2000) and by applying RCA buffer widths in the areas proposed, there are no expected cumulative effects as a result of sedimentation to the streams from this project. By reducing the risk of a catastrophic wildfire and improving forest health, future cumulative effects on a large scale are being avoided. Restoration work to existing roads and waterholes would help enhance recovery of Steeley Fork Cosumnes River and reduce road density.

A request letter dated October 21, 2002 to the Fresno office of California Department of Forestry resulted with some recent and planned timber harvest plans on private lands in the watersheds where this project is located (Table 5)(USDA 2003). In order to summarize the more significant projects for cumulative effects, private and USFS projects causing land disturbance implemented since 1999 are listed, as well as projects between 1990-1999 with acreage above 100. All historic projects for all years that added land disturbance cumulative watershed effects are in the hydrology report associated with this project (USDA 2003). Table 5 shows land disturbance affecting the entire watershed areas. These would not necessarily have a localized effect on the area of the project. Any land disturbance affecting the stream corridor upstream from the streams of the project may possibly contribute to cumulative effects.

The majority of activities in Table 5 are USFS projects. During the last decade protective measures for streamside zones have become more and more restrictive. Although timber harvest plans on private land during the last decade have had stream buffer requirements that protect the streams, the intensity and size of these activities on private land vary, but in many cases result in fragmentation of habitat for many species. Often these activities decrease and degrade the amount of aquatic suitable habitat, making National Forest lands increasingly important for these species. Any timber activities being planned in the future by the USFS are following the standards and guidelines established under the Sierra Nevada Forest Plan Amendment. The effects of all of these sales in the project area would promote the growth of larger trees that would eventually contribute large down woody debris to the RCAs sooner. Stream buffers are provided to assure protection from sedimentation or effects from crushing.

Future known projects to be implemented in 2003-2007 are the Plantation Protection Project, Ridgerunner Prescribed burning, Lincoln Log Rx burn, Simpson Prescribed Burn, and Clear

Plantation Fuels Reduction, all USFS projects. These are described in the cumulative watershed supplements for the project watersheds (USDA 2003).

Conclusions: Combining all the cumulative effects from other activities in the watersheds of the project area over time may possibly have contributed to the present low population status of the species in localized stream populations. The most prominent effect to western pond turtles may be from timber harvest activities impacting nesting and over-wintering sites. These areas are beyond the buffers traditionally placed on streams with timber projects. Roads were probably another significant factor affecting western pond turtles, by providing easier access to the public for collecting individuals, and by crushing from vehicles. Bullfrogs introduced into ponds are also a factor affecting quality of habitat for western pond turtles. Historic land treatments caused habitat degredation by sedimentation that may have filled western pond turtle pool habitat, some of which has recovered over time. Treatments in the last ten years on National Forest lands have been more protective of the stream course with buffers and water quality BMPs. Effects to aquatic and riparian habitats are assumed to be greater under private management than under National Forest ownership and are likely to have more intensive treatments resulting in greater ground disturbance and smaller streamside buffers. Future USFS protection and restoration measures in the RCAs, such as road obliteration, as provided by the Framework decision, would help improve the habitat and water quality of these watersheds, but continue to impact western pond turtle nesting and over-wintering sites.

Summary

Maintenance and improvement of the aquatic habitat is expected over the long term by reducing the potential for large wildfires. Turtles or their eggs could be crushed by heavy equipment during movements for nesting, or be burned during under-burning as eggs in the nest or as hatchlings or adults while traveling through the area. Movement for over-wintering is a poorly understood aspect of turtle behavior. There are many project units with attributes of nesting habitat according to the GIS query, some within 500 meters of streams that could be used for nesting during May to July. Due to the low density of turtles observed, though, the likelihood that western pond turtles or their nests are present in the project units during the time of the proposed activities is low.

Determination of Effects

It is my determination that this project may impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability for the western pond turtle.

VI. SUMMARY OF DETERMINATIONS

- California red-legged frog: It is my determination that this project would have no effect on the California red-legged frog or its habitat.
- Foothill yellow-legged frog: It is my determination that this project may impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability for the foothill yellow-legged frog.
- Western pond turtle: It is my determination that this project may impact individuals, but is not likely to cause a trend toward Federal listing or a loss of viability for the western pond turtle.

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Appendix A

Unit Acreages Proposed for Treatment and Prescriptive Land Allocations

Unit	Total Acres	Masticate or Crush Brush Acres	Mechanical Thin Acres	Hand Thin & Pile Acres	Small Tree Thin & Machine Pile Acres	Under Burn Acres	Defense Acres	Threat Acres	Owl PAC Acres	Goshawk PAC Acres *	Owl Home Range Core Area Acres
121	158	74					74	84	6		
144	25	12		X	12	25	9	16			
146	24	12		X	12	24	24				
148	16	8			8		16				
150	7	3			3		7				
169	30	10	15	X	10	30	30				0
227	24		11		11		24		19		11
228	61		61	X	30		5	56			60
229	8	8		X			8				
230	28		8		20		28				8
231	9	3	6		3		9				0
232	20		17	X	10		18	2		3	17
234	15		15				15				15
237	25		10	X	10	25	25		25		10
246	17		17	X	17	10	17		2		0
247	9		5		5	9	9			9	5
248	44		44		11	44	44				40
250	11		6		6	11	11				2
254	54		25	X	25	54	54				0
255	3		3		3	3	3				0
256	24		16		12	24	24				0
257	8	8		X		8	8				
259	30	10	10		10	30	30			6	10
263	25		20		10	25	25				0
264	14		7		11		14				0
268	14		7		7	5	14			14	7
269	37		18		18	37	37		2		0
274	11		6		6	5	11				0
275	10		5		5		10				0
277	26		26		13	26	26		2		20
290	34					34		34	33		
291	64		64	X	30		64				64

292	48		24	X	24	48	48				0
293	22		20		12	22	22				20
296	48		24	X	12	48	48				0
297	14		7	X	7	14	14				0
298	24		24	X	12	24	24				24
299	44		40	X	20	44	44				40
300	47					47	47		21		
301	21					21	21				
302	155			X		155	104	51	8		
303	110					110	30	80	40	66	
304	66					66		66	50		
544	15	5		X		15	15				
616	56			X		56	40	16	52		
623	55			X		55	28	27	47		
646	101			X		101	73	28	98		
Totals	**1711**	**150**	**561**		**402**	**1255**					

APPENDIX B
Map of Project Area

APPENDIX C
Species Accounts

California Red-legged Frog

Management Status and Direction: On June 24, 1996, the California red-legged frog, *Rana aurora draytonii*, was listed as federally threatened (Federal Register May 23, 1996). USFWS identified proposed critical habitat in a draft recovery plan (USDI 2000a). On March 13, 2001 the Federal Register designated critical habitat for the California red-legged frog (USDI 2001). On November 6, 2002, the critical habitat designation was challenged in court and resulted with the designation being removed from all lands in El Dorado County. The final recovery plan for the California red-legged frog was published May 28, 2002 (USDI 2002).

Habitat Account**:** Along the west slope of the Sierra Nevada, California red-legged frogs (Rana aurora) are assumed to occur at elevations below 5,000 feet (USDI 2000a), although in the area of Eldorado National Forest they have never been sighted above 3,500 feet. Breeding occurs from November through March with earlier records occurring in southern localities (Storer 1925). Egg mass detections in Spivey Pond (see "existing surveys and sightings" below) indicate the breeding season extends into April in the central Sierra Nevada foothills. Temperature does not seem to be a limiting factor for successful reproduction (Jennings, in litt., 1996). Egg masses containing 2,000 to 5,000 eggs are laid during or shortly after large rainfall events in late winter or early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Storer 1925). Larvae undergo metamorphosis 3.5 to 7 months after hatching between July and September (Storer 1925, Wright and Wright 1949, Jennings and Hayes 1994). Sexual maturity by males can be attained at 2 years of age by males and 3 years of age by females (USDI 2000a), and CRLF may live 8 to 10 years (Jennings et al. 1992).

The diet of CRLF is highly variable. Larvae probably eat algae (Jennings et al. 1992). Hayes and Tennant (1986) found invertebrates to be the most common food items of adult frogs. Vertebrates, such as Pacific tree frogs (Hyla regilla) and California mice (Peromyscus californicus), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1986). Feeding activity likely occurs along the shoreline and on the surface of the water (Hayes and Tennant 1986).

California red-legged frogs require a permanent water source to ensure that aquatic habitat is available year-round. Permanent water sources can include, but are not limited to, ponds, perennial creeks, permanent pools within intermittent creeks, seeps, and springs (USDI 2001). They live in low gradient streams (USDI 2001). Low gradient streams have been defined in Rosgen (1996) as being below 2% gradient, with above 2% being considered moderate gradient. According to the USFWS, gradients up to 4% may have habitats considered suitable for CRLF.

The primary areas where these frogs were found in the Central Valley of California were intermittent streams that included some area with water at least 2.3 feet deep, had largely intact emergent or shoreline vegetation, lacked introduced bullfrogs, and tended to have native rather than introduced fish (Hayes and Jennings 1988). Dense vegetation close to the water and shading of moderately deep water appeared to be the most important characteristics (Ibid). These are not limiting factors, as CRLF have also been observed inhabiting stock ponds and artificial pools completely devoid of vegetation. Suitable breeding habitat is defined by the USFWS (USDI 2001) as aquatic habitat with a minimum water depth of 0.5 m (1.64 feet) which maintains water during the entire tadpole rearing season, at least March through July. Egg masses are usually placed in quiet pools of slow-moving streams (Basey and Sinclear 1980) or ponds. Eggs are typically attached to vertical emergent vegetation such as bulrushes or cattails (Jennings et al.

1992) so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). Suitable egg brace sites in these pools are needed, such as aquatic vegetation, small woody material, or rootlets. The pools should also have a general lack of introduced aquatic predators such as centrarchid fishes, crayfish, and bullfrogs (Rana catesbeiana) (Jennings, in litt., 1996).

During dry periods, the California red-legged frog rarely is encountered far from water (USDI 2000b). During periods of wet weather, starting with the first rains of fall, some individuals may make overland excursions through upland habitats. Most of these overland movements occur at night (USDI 2000b). Hayes and Tennant (1986) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. CRLF have been documented to travel 3.6 km (2.25 miles) in a virtual straight line migration from nonbreeding to breeding habitats (USDI 2001). But this is likely the upward limit of dispersal capability. Newly metamorphosed juveniles tend to disperse locally July through September and then disperse away from the breeding habitat during warm rain events (USDI 2000a). This dispersal is important for the long term suvival and recovery of the species as the dispersing individuals can recolonize areas subjected to localized extinctions (USDI 2000a).

Sheltering habitat for the CRLF is potentially all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture during the dry season up to 300 feet from breeding habitat. This could include boulders or rocks and organic debris such as downed trees or logs; industrial debris; and agricultural features, such as spring boxes, abandoned sheds, or hay-ricks. Incised stream channels with portions narrower than 18 inches and depths greater than 18 inches may also provide sheltering habitat (USDI 1996a). California red-legged frogs also shelter in small rodent burrows and moist leaf litter (Jennings and Hayes 1994). CRLF found in coastal drainages are rarely inactive (Jennings et al. 1992), whereas those found in interior sites may hibernate (Storer 1925).

CRLF populations persist and flourish where suitable breeding and nonbreeding habitats are interspersed throughout the landscape and are interconnected by unfragmented dispersal habitat. Where this habitat mosaic exists, local extinctions may be counterbalanced by the colonization of new habitat or recolonization of unoccupied areas of suitable habitat (USDI 2000a). Isolated patches far removed from occupied patches eventually go extinct (USDI 2000a). Because of this populations of CA red-legged frogs are most likely to persist where multiple breeding areas are within an assemblage of habitats used for dispersal (USDI 2000a).

Existing surveys and sightings: There has been one one known occurrence of this species on the Eldorado National Forest. On June 18, 2001, one female was detected in a pond on Ralston Ridge on the powerline transmission corridor.

In the vicinity of the Eldorado National Forest but not on NF lands, adult California red-legged frogs were detected at two locations in the North Fork Weber Creek during 1975 and 1996 and one location on the South Fork Weber Creek in 1975. Egg masses and adults have been detected BLM land in Spivey Pond on the North Fork Weber Creek in 1997, 1998, 1999, 2000, and 2001. In addition, there are eight other locations east of Highway 49 within Placer, El Dorado, and Amador Counties where California red-legged frogs have been historically reported. These locations are: approximately four miles ENE of Foresthill, one half mile NE of Dutch Flat, South Fork Weber Creek at Snows Road, Traverse Creek at Traverse Creek Road, one mile SE of Placerville, tributary to the North Fork of the Cosumnes River N of Plymouth, Sutter Creek between Sutter Creek and Volcano, and a pond in the Misery Creek drainage near Pioneer (Jennings and Hayes 1992). The North Fork Weber Creek detection at Spivey Pond is at an elevation of 3,200 feet. All of these historic and current sightings occurred below 3,500 feet in elevation.

During 2001, breeding habitat surveys were conducted on many streams, as shown in Table 1. Streams surveyed were predominantly less than 2% gradient and below 4,500 feet in elevation. No California red-legged frogs were detected, and potential breeding habitat was found to be sparse and consisted of only limited microsites.

During 1997, intensive surveys were conducted on portions of two streams within the Eldorado National Forest, Sopiago and Big Canyon Creeks. A 1997 survey of the South Fork American River for California red-legged and foothill yellow-legged frogs between Alder Creek and approximately 0.5 mile downstream of Riverton resulted in no observed amphibians (Jones and Stokes 1997). Four reaches of three streams were surveyed in 1995, Bear Creek, Rock Creek, and Camp Creek (Fellers and Freel 1996). No CRLF were found in any of these surveys. The streams surveyed in 1995 were considered unlikely habitat for CRLF, primarily due to the lack of slow moving water and shrubby or emergent vegetation required for egg laying and cover for adults (Fellers and Freel 1996). Two streams were surveyed in both 1992 and 1993, Steely Fork of the Cosumnes River and Big Canyon Creek (Martin 1993, Martin, in litt., 1994). Numerous stream surveys in project areas below 5,000 feet elevation have not found any CRLF.

Numerous stream surveys on the Eldorado National Forest below 5,000 feet elevation have not found any CRLF (Table 1). The following stream surveys have occurred, some to USFWS CRLF protocol and some not to protocol.

Table 1. Stream surveys performed for CRLF in locations below 5000 feet in elevation,

Stream	Year	Survey to Protocol?
Whaler Creek	1994	No
Slab Creek	1994	No
Brush Creek	1993	No
Incline Creek	1993	No
Gasparni Creek	1993	No
Sopiago Creek	1997 1997, 2001	Yes No
Big Canyon Creek	1997 1992	Yes No
Steely Fork Cosumnes River	1992, 1993, 1998, 2001	No
Bear Creek	1995, 2001	No
Rock Creek	1995, 2001	No
Camp Creek	1995	No
South Fork American River	1997	Yes
Traverse Creek	1991 and 1995	No
North Fork Weber Creek	1997	Yes
Rock Canyon Creek	1991	No
Snow Canyon Creek	1992 and 1993	No
South Fork Long Canyon Creek	1999 and 2000	No
South Fork Silver Creek	1999	No
West Panther Creek	2000	No
Middle Fork Cosumnes River	2001	No
Long Canyon Creek	2001	No
South Fork Long Canyon Creek	2001	No
Middle Dry Creek	2001	No
Baltic Creek	2001	No
Hazel Creek	2001	No
Soldier Creek	2001	No
Dogtown Creek	2001	No
Clear Creek	2001	No

McKinney Creek	2001	No
Steeley Fork Cosumnes River	2001	No
Clear Creek	2002	Yes
Dogtown Creek	2002	Yes
Shingle Mill Gulch	2002	Yes
McKinney Creek	2002	Yes
Rubicon River	2002	Yes
Middle Dry Creek	2002	Yes

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Western Pond Turtle

Management Status and Direction: The northwestern (Clemmys marmorata marmorata) and southwestern (Clemmys marmorata palida) pond turtles are designated as sensitive species in Region 5 of the Forest Service. The USDI Fish and Wildlife Service was petitioned to list the western pond turtle in 1992 under the Endangered Species Act, but determined there was insufficient information to warrant listing.

Habitat account: The western pond turtle (Clemmys marmorata) is found from northwestern Baja California, Mexico, north to the Columbia River, Washington. This species is primarily found to the west of the Sierra-Cascade divide. The northwestern subspecies (C. m. marmorata) occupies the northern portion of the species range south to San Francisco Bay on the coast and the Mokelumne River in the Sierra Nevada (Holland 1991). The portion of the Eldorado National Forest south of the American River and continuing south into the San Joaquin Valley and southern Sierra foothills is considered an intergrade zone between the northwestern and southwestern pond turtle subspecies (C. m. pallida). The Mokelumne River is in this intergrade zone and any populations in this drainage will be considered as western pond turtles for the purpose of this evaluation as subspecific identification has not been attempted for intergrades. This species historically occurred from sea level to 5,000 feet, although turtles are scarce

anywhere above 4,500 feet (Holland et al. 1992), but have been observed up to higher elevations in the 6,000 feet range (Holland 2002).

Western pond turtles are habitat generalists, occurring in a wide variety of permanent and intermittent aquatic habitats including rivers, streams, lakes, ponds, vernal pools, and other seasonal and permanent wetlands. They could occur in most stream gradients (Holland 2002). Turtles still exist in small numbers in most large river systems in the central and northern parts of the range, although most populations currently exist in smaller streams, usually in montane areas. Turtles are also known to occupy artificial aquatic habitats such as small reservoirs, canals, farm ponds, and sewage treatment plants (Holland 1991).

Hatchling and small juvenile pond turtles require specialized microhabitats characterized by shallow water (usually < 30 cm deep), presence of emergent vegetation, and clusters of small branches in the water. These microhabitat features probably function as sheltered basking sites, shelter from predators, foraging sites with large numbers of invertebrate prey, and abundant hauling out sites. In rocky streams with little or no emergent vegetation, hatchlings and small juveniles are usually found in shallow, quiet, rocky pools off the main stream course (Holland 1991).

Age and size at first reproduction varies geographically (Holland 1991). In northern California, the smallest known gravid female was 130 mm and probably 10-12 years old (Holland 1991). Most females oviposit in alternate years producing single clutches of 1-13 eggs. Incubation time has been documented ranging from 73-80 days in captivity (Feldman 1982) and from 95-106 days for naturally incubated nests along the Columbia River in Washington (Holland 1991). Oviposition occurs during May through July, with one record in the San Joaquin drainage occuring on June 7. Hatchlings vary in size from 23-31 mm in carapace length and most are thought to overwinter in the nest. Suvivorship in hatchlings and small juveniles is low, with approximately 8-12% of the first year cohort surviving to the second year. Males appear to have a higher probability of survivorship than females, probably due to a lower exposure to predators than females during nesting efforts. Known longevity from marked individuals has been estimated at 39-40 years, and the potential lifespan may be more in the order of 50-70 years (Holland 1991).

Female pond turtles are known to move from 14 to 402 m from water to nest. At one site in the San Joaquin River drainage, nest sites ranged from 19.5 to 65 m from water. The majority of nest sites have been found on dry, well drained soils with significant clay/silt content and low (<15 degree) slope. Most have been in open areas dominated by grasses or herbaceous annuals, with few shrubs or trees in the immediate vicinity. Exposure varies, but most are found on south or southwest facing slopes (Holland 1991).

The western pond turtle is a dietary generalist and opportunist, and seasonal or periodic shifts in diet occur in response to prey availability (Holland 1991). The majority of the diet in most areas consists of small to moderate sized invertebrates (Holland 1991). Vertebrates have also been documented as prey, including small fish, amphibian larvae and small juvenile frogs (Bury 1986). Plant material has been documented in the diet of pond turtles but is uncommon. Carrion is often a major item in the diet of turtles, including carcasses of a variety of invertebrates and all classes of vertebrates (Evenden 1948, Holland 1985, Bury 1986).

Foraging occurs throughout the water column and prey are swallowed under water. Although turtles occasionally take prey out of water (Carr 1952) there is no evidence that they are able to swallow in air. Most foraging occurs in the early morning and late afternoon during the summer, and may extend into the early evening. In stream habitats, turtles have often been observed foraging below riffles, possibly waiting for drifting prey (Holland 1991).

Western pond turtles may engage in overland movements that are not reproductive in nature or in apparent response to flooding. Turtles have been found crushed on roads adjacent to watercourses for distances up to 200 m. Animals of both sexes have been observed moving overland at distances of 0.5 km from the nearest watercourse. The majority of these movements has been observed during early spring and late fall and may represent movements from and to upland over-wintering sites. Over-wintering is a poorly understood aspect of turtle behavior. It is uncertain whether pond turtles hibernate in the physiological sense. In montane areas, at least a portion of turtle populations have been observed moving into adjacent upland areas during the winter. They have been found under logs and buried in leaf litter (Holland 1991).

Existing surveys and sightings: Although surveys specifically for western pond turtles have not been conducted on the Eldorado National Forest, they have been observed at 16 locations on the Eldorado NF since 1990. They have been found in the Rubicon, South Fork American, Cosumnes, and Mokelumne River drainages. All observations have been incidental to other activities including fish habitat and amphibian surveys. Five of the sightings have been individuals observed crossing roads, usually within 200 feet of perennial streams, except for one individual observed approximately 3,700 feet from the nearest perennial water source. All sightings associated with streams have been individual juvenile and adult turtles. A maximum of three turtles have been observed at one site involving two small artificial ponds. Pond turtles have also been reported from a variety of aquatic habitats at lower elevations immediately to the west of the forest. Sightings ranged in elevation from 1,600 to 4,640 feet in stream, pond, reservoir, and upland habitat.

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Foothill Yellow-Legged Frog

Management Status and Direction: The foothill yellow-legged frog (Rana boylii) is designated as a sensitive species in Region 5 of the Forest Service.

Habitat account: On the Eldorado National Forest, potential habitat for foothill yellow-legged frogs (Rana boylii) is considered to be all perennial streams and intermittent streams with persistent pools below 6,000 feet elevation (Stebbins 1985). The foothill yellow-legged frog is a highly aquatic amphibian that is primarily restricted to riverine habitats (Zweifel 1955, Stebbins 1972), and is rarely seen far from streamside habitats (Nussbaum et al 1983, Stebbins 1972). Unlike most other ranid frogs in California, this species is rarely encountered (even on rainy

nights) far from permanent water (CDFG 2001). When frightened, it dives to the bottom and takes refuge among stones, silt, or vegetation. During periods of inactivity, especially during cold weather, individuals seek cover under rocks in the streams or on shore within a few meters of water (CDFG 2001).

Habitat variables among those considered necessary to support populations of this species include: stream flow and relative size; stream substrate type; availability of sunny basking sites; and absence of introduced aquatic amphibian predators. Stream size typical of foothill yellow-legged frog habitat is small to moderate, with surface water usually persistent at least in plunge pools, although larger rivers are also utilized. The streambed always includes some percentage of 75-300 mm diameter substrate (cobble), and may also be comprised of bedrock, boulders, and gravel or sand. This species is usually detected in streams that have open, sunny banks (of all substrate types) which are used as basking sites (Fellers and Freel 1996). Adults congregate around breeding pools in April, May and June, and may disperse in the summer months moving into riparian vegetation, moving up tributaries, or reducing diurnal activity (Ashton et al. 1998).

Breeding and egg-laying usually occur from mid-March to early June, after high water of streams subsides (Stebbins 1985). Egg masses are usually laid in the stream margin, at a depth of less than half a meter, and with flow velocities of 0.0 to 0.21 m/second (Ashton et al. 1998). Fuller and Lind (1993) found breeding sites were exposed to significantly greater solar radiation than otherwise suitable sites which met established criteria based on water depth, velocity, substrate size, and distance from the streambank. Cobble/pebbles are the preferred substrate for egg mass attachment, but they have also been found attached to aquatic vegetation, woody debris, and gravel (Fuller and Lind 1993). Eggs hatch in 5 to 30 or more days (Zweifel 1955), probably depending on water temperature (Ashton et al. 1998). Larvae metamorphose by late summer or early fall in 3 to 4 months (Nussbaum et al. 1983). Frogs reach maturity 1 to 3 years after metamorphosis. The life span may be 12 years or more, based on studies of other ranids (Duellman and Trueb 1986).

Primary threats to these frogs are the construction of dams (Lind et al. 1996). and predation by bullfrogs *(*Rana catesbeiana*)* in the Sierra (Moyle 1973). Garter snakes feed heavily on tadpoles and adults (Fitch 1941). Centrachid fishes readily eat Rana eggs (Werschkul and Christensen 1977), and, where introduced into foothill streams, may also contribute to the eliminiation of foothill yellow-legged frogs.

On a worldwide basis, acid precipitation, ultraviolet radiation, viruses, pesticides, habitat destruction, and global climate change have all been suggested as causes for the decline of amphibians (Carey 1993). Increased isolation caused by these many causes may have contributed to the extinction of some foothill yellow-legged frog populations because smaller populations of organisms are generally more susceptible to extinction via stochastic events than are larger ones (Wilcox 1980, Hanski 1989, Hanski and Gilpin 1991). This effect may be pronounced in temperate anurans such as foothill and mountain yellow-legged frogs because they often show wide swings in population size in response to environmental factors (Pechmann et al. 1991, Sjogren 1991). Increased isolation of these populations may also have significantly reduced the probability of recolonization of a site where extinction occurred (Wilcox 1980, Hanski and Gilpin 1991). This effect may occur due to the decreased size of potential source populations, the increased distance from source populations, and direct predation on dispersing individuals (Hanski 1989, Sjogren 1991).

On the Eldorado National Forest, potential habitat for foothill yellow-legged frogs is considered to be all perennial streams and intermittent streams with persistent pools below 6,000 feet elevation. Adjacent riparian and terrestrial areas may provide dispersal and sheltering habitat during the wet season, from October 1 through March 31. This dispersal and sheltering habitat is

defined by the following streamside management zone (SMZ) widths (also called Riparian Conservation Areas in Sierra Nevada Framework) on each side of the stream channels:

Perennial streams - 300 feet
Seasonally flowing streams - 150 feet

Existing surveys and sightings: Amphibian surveys that included foothill yellow-legged frogs as target species have been conducted on the Eldorado National Forest. Surveys of eight stream reaches in the elevational range of this species were conducted by a contractor during 1992 and 1993 (Martin 1993, Martin, in litt., 1995) , four stream reaches in 1995 (Fellers and Freel 1996), and one stream reach in 1997 (Jones and Stokes 1997) documenting occurrence at 2 of the locations. The occurrences at the remaining locations were documented during fish stream surveys beginning in 1992 and incidental to various other field activities and surveys on the forest. They have been found in the Rubicon, South Fork American, Cosumnes, and North Fork Mokelumne River drainages.

Foothill yellow-legged frogs have been reported at 11 locations on the Eldorado National Forest since 1992: Bark Shanty Canyon Creek, Upper Camp Creek near Pilliken, Lower Camp Creek near Jenkinson Lake, Snow Creek, Sopiago Creek, Soldier Creek, Rubicon River from its mouth upstream for 6.2 miles (5 locations), Rubicon River near Ellicott Bridge, unnamed tributary to North Fork Wallace Canyon Creek, and South Fork American River at the upper limit of Slab Creek Reservoir. Mountain yellow-legged frogs (Rana muscosa) have also been reported at the Bark Shanty Canyon and Upper Camp Creek localities indicating sympatry or possible misidentification. These two localities are within the elevational range of overlap between these two species as is the North Fork Wallace Canyon tributary location. The elevational range for these 11 locations are 1320 to 4580 feet.

During 1973 through 1776, unidentified frogs were noted in several fish stream survey reports that were most probably foothill yellow-legged frogs based on their their use of stream habitat and elevation. These locations are: Rubicon River near the confluence of Big Grizzly Canyon Creek, Otter Creek upstream from Missouri Canyon Creek, North Steely Creek, Middle Dry Creek, and Sopiago Creek.

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