United States Department of the Interior

FISH AND WILDLIFE SERVICE
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In Reply Refer To:
1-1-06-I-0818

JUL 27 2006

Ray Porter, District Ranger
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P.O. Box 559
Prather, California 93651

Subject: Review of the Draft Environmental Impact Statement for the Kings River Project, Sierra National Forest, California, for Effects on the Fisher and the Yosemite Toad.

Dear Mr. Porter:

This is in response to your February 16, 2006, request for the U.S. Fish and Wildlife Service (Service) to review the potential effects of the Kings River Project in the High Sierra District of the Sierra National Forest (NF), on the fisher (*Martes pennanti*) and the Yosemite toad (*Bufo canorus*). Both the fisher and the Yosemite toad have been designated as candidate species; candidate species are species for which the Service has on file sufficient information on biological vulnerability and threats to support a proposal to list them as threatened or endangered species. Listing priority is reevaluated annually in a Candidate Notice of Review (CNOR) based on the best available information on the current status of and threats to each candidate species. Our comments and recommendations are made under the authority of the Endangered Species Act of 1973, as amended (16 USC §1531 *et seq*) (Act) and our Mitigation Policy of 1956.

These findings and recommendations are based on: (1) the January 2006 *Draft Environmental Impact Statement: Kings River Project* (DEIS); (2) the November 2005 *Biological Assessment and Biological Evaluation For the Initial Eight Management Units (2006-2008) On the Kings River Project*; (3) the January 2006 *Aquatic Species Biological Assessment & Biological Evaluation (Including Management Indicator Species Evaluation) for the Draft Environmental Impact Statement Kings River Project Initial Eight Management Units (2006 through 2008)*; (4) a February 24, 2006, meeting in Sacramento attended by Kathy Brown, Laura Finley, and Pete Trenham of the Service and Ross Peckinpah, Mark Smith, and Phil Strand of the Forest Service; (5) March 29 and 31, 2006, Forest Service responses to the Service's questions on the DEIS; (6) a March 30, 2006, teleconference attended by Bill Zielinski of the Forest Service Pacific Southwest Research Station and Roberta Gerson and Pete Trenham of the Service; (7) an April 25, 2006, site visit attended by Pete Trenham and Laura Finley of the Service and Mark Smith, Ross Peckinpah, Ramiro Rojas, Kim Sorrini, Holly Sanders, Phil Strand and Carolyn Hunsaker of the Forest Service; (8) email and telephone communications between Pete Trenham of the Service and Ross Peckinpah, Ramiro Rojas, Kim Sorrini, Carlos Cabrera, and Holly Sanders of the Forest Service between February and June 2006; (9) a May 30, 2006 meeting attended by Pete Trenham, Roberta Gerson, and Cay Goude of the Service and Mark Smith, Ramiro Rojas, Ed Cole, Kim Sorrini, Phil Strand, Ross Peckinpah, and Bob Hawkins of the Forest Service; and (10) other information available to the Service.

Description of Proposed Action

For the proposed action the Sierra NF will treat eight management units, totaling 13,756 acres, with a combination of uneven-aged timber management, small group selection, and prescribed fire. Treatments will be applied between 2006 and 2008. These 13,756 acres fall within the 131,500 acre Kings River Project (KRP) area in the Dinkey Creek and Big Creek watersheds, Fresno County, California. The stated purposes and needs of the KRP are: 1) restoring pre-1850 forest conditions across a large landscape; 2) restoring forest health; 3) reducing fuel build-up; 4) improving sustainability of shade intolerant species; 5) reducing fuel in the Wildland Urban Interface (WUI); 6) eradicating noxious weed infestations; 7) watershed restoration at specific locations; and 8) providing opportunities for research. The elevation of the area affected ranges from approximately 800 - 9800 ft, and includes the following vegetation types: ponderosa pine, mixed conifer, lodgepole pine, red fir, hardwood species, and areas dominated by rock and brush.

For this project three alternative actions are being considered. The "no action" alternative and "35 inch (in)" diameter at breast height (dbh) alternative were described in the DEIS; a "30 in" dbh limit alternative is also being considered. The 35 in and 30 in alternatives involve a complicated layering of treatments over time. In most cases, implementing the planned treatments will require two to three seasons (e.g. preparation and logging of the management unit may begin in 2006 followed in 2007 by burning and herbicide treatments with re-planting of trees and additional herbicide treatments in 2008). Across the eight management units there are 9,751 acres planned for mechanical treatments (64% of which will be commercially harvested) using a combination of helicopter, tractor bunch for helicopter, and tractor only methods; 1,183 acres will be treated with the herbicide glyphosate for both noxious weed control and for plantation and reforestation group treatments; 437 acres will be thinned to remove small damaged trees and as part of reforestation activities; 1,602 acres of plantations will have brush masticated, thinned, tractor piled, hand release of brush, and/ or replanted with seedlings; 9,461 acres will have prescribed burning of either broadcast burn, tractor pile burns, jackpot slash burns, and/or underburns with fire lines. There is an estimated 190.7 miles of road maintenance, 84.7 miles of road reconstruction, and 1.7 miles of new road construction within the eight management units. There are currently an unknown number of miles of temporary roads and skid trails needed. There are also 32 sites planned for watershed restoration as part of the proposed action. The main treatments applied in the KRP are: 1) uneven-aged timber harvest; 2) prescribed fire; and 3) small group selection.

The KRP uneven-aged silvicultural system is based on the following guidelines: 1) harvesting trees less than the maximum diameter size class (i.e., 35 or 30 in dbh); 2) thinning trees less than the size limit will be used to shift the tree size distribution to more closely match an inverse J-curve with a 20% diminution quotient. Six of the eight units contain California spotted owl study areas where thinning will be limited to trees less than 20 in, 10 in or 6 in dbh; the remaining two units contain areas where thinning will be limited to trees less than 20 in dbh. Trees selected to remain will be those most capable of utilizing the available growing space, providing nest sites for wildlife, stabilizing banks, reducing horizontal fuels continuity, and restoring historical species composition. Residual stocking levels are set to meet canopy cover goals and are determined for each stand based on site characteristics and management goals. Stands within WUI (defense or threat zones) or defensible fuel profile zones (DFPZs) will be single storied, while those outside will be two or three storied. Of the eight units, four fall entirely within and three partially overlap WUI or DFPZ areas.

Prescribed fire will also be used to reduce the amount of accumulated fuel and assist attempts to restore the pre-1850 forest conditions. Treatments prior to prescribed burns including hand piling (420 acres), lop and scatter (3,149 acres), crush brush (136 acres), grossyard (316 acres), mastication (1,031 acres), and tractor piling (4,072 acres). Underburning using low to moderate intensity fire will consume brush and kill small trees. Underburning will be applied to 4,685 acres in the eight management units. Pile burning will be applied to 4,491 acres. Smaller areas (less than 150 acres each) will be treated with broadcast and jackpot burns.

The KRP will include three DFPZs. DFPZs are strategically located to serve as control points for fire suppression activities in the event of a wildfire. A combination of treatments, primarily timber harvest, hand thinning, tractor piling, mastication, and underburning, will be used to create DFPZs. The desired condition of DFPZs will be maintained using a combination of hand thinning, tractor piling, and underburning. Maintenance treatments could begin two to four years following initial treatment; re-evaluation is planned for every two years.

For the 35 in alternative, reforestation groups will occupy approximately 10% of each management unit, and individual groups will usually be less than three acres. Reforestation groups will be within portions of stands dominated by brush, sparse vegetation, or openings. In reforestation groups trees ≥35 in diameter at breast height (dbh) will not be harvested; if trees ≥35 in dbh are absent, then four trees >24 in dbh will remain. Uneven-aged timber harvest will be applied to areas outside of the reforestation groups. The 30 in alternative has no reforestation groups.

Within the KRP, areas with records of California spotted owl nesting are designated as protected activity centers (PAC). Under the Sierra Nevada Forest Land Plan Amendment FEIS, 300-acre protected activity centers will be established for known and discovered California spotted owls to protect breeding adults and their offspring. Limited operating periods will be applied to these PACs during nesting seasons. Home range core areas (HRCA) surrounding each territorial spotted owl activity center detected after 1986 will be established outside of the WUI. Home range core sizes will be 300 acres on the Sierra NF. Combined, the HRCA and the 300-acre PAC will total 600 acres. Maximum harvestable size of trees within PAC and HCRA areas ranges from <6 in to <20 in dbh.

The herbicide glyphosate will be used to eradicate patches of noxious weeds, and to reduce competition from brush in reforestation groups or existing plantations. Glyphosate will be applied using backpack sprayers. Within the eight management units, glyphosate will be applied on 1,183 acres.

KRP watershed restoration activities will include obliterating non-system roads, repairing gullies below culvert outlets and along skid trails, gravelling roads, and subsoiling skid trails. Watershed restoration projects are planned for four of the eight management units.

Protection Measures Applicable to Fisher:

1) The long-term goal of the 35 in alternative is to develop or maintain 50% of the area of potential fisher habitat in "California Wildlife Habitat Relationships" (CWHR) class 4 (11-24 in dbh) or higher with 50% canopy or greater; for the 30 in alternative the goal is to develop or maintain 50% of the landscape outside of WUI with canopy density >60%.
2) To reduce disturbance to potential denning fishers, to the extent practicable, prescribed burning will be conducted outside of the denning season (mid-March to mid-May).
3) Protect important habitat structures such as large diameter snags and oaks, patches of dense large trees (typically ¼ to 2 acres), large trees with cavities for nesting, and coarse woody material; use firing patterns and place fire lines around snags and large logs to minimize effects of underburning. The "Fisher and Priority Sites Marking Guide – Kings River Project" will be used to identify the most suitable individual trees and groups of trees for retention.
4) Large trees suitable for denning and resting fishers will be maintained by harvesting only trees smaller than specified limit; in addition oaks are not proposed for harvest.
5) Create a system of "old forest linkages" (OFLs) along perennial streams and including 300' of adjacent habitat with 50-60% canopy cover on each side of the streams; treatments within OFLs will otherwise be the same as in adjacent stands.
6) Monitor high quality fisher habitat in two or more of the eight KRP management units and untreated control units, and adapt management of fisher habitat based on the best available information.

Protection Measures Applicable to the Yosemite toad:

1) No mechanical treatments within 100 ft of meadows
2) Trees may be felled within 100 ft of meadows and removed by means of a cable; around meadows used as breeding habitat by Yosemite toads, only trees 50 or more feet away from the meadow will be felled.
3) Within 0.6 miles of occupied meadows, operations will start after breeding is over and end by October 1, and operations will cease for 24 hrs after rainfall >0.1 in.
4) Heavy machinery will be kept at least 50 ft from moist upland habitats where toads are likely to be present during the summer, such as willow and lupine patches, but trees may be felled within this area and removed by means of a cable.
5) No chemical treatments within 500 ft of occupied meadows.
6) No water drafting within 0.6 miles of occupied meadows.

Status of Species and Environmental Baseline

Fisher

On April 8, 2004, in a 12-month finding for a petition to list the west coast distinct population segment of the fisher, the Service added the fisher to the list of candidate species. The fisher is a mammal with a long slender body and short legs. Sexual dimorphism is pronounced with males weighing between 7.7 and 12.1 lbs and females weighing between 4.4 and 5.5 lbs (Powell 1993). Males range in length from 35 to 47 in and females range from 30 to 37 in (Powell 1993). Based on an examination of several skins, Grinnell *et al.* (1937) noted that fishers from the Sierra Nevada tend to be paler in color than fishers from other parts of the United States.

A member of the family Mustelidae, the fisher is the largest member of the genus Martes, which includes the yellow-throated martens, true martens and fishers. *Martes pennanti* is the only extant species of the fisher. In 2004, the Service concluded that despite insufficient genetic information to determine whether it warrants subspecific status, the Pacific fisher does represent a distinct population segment (US Fish and Wildlife 2004). The Service concluded that the Pacific fisher is a "species" as defined by the Act (US Fish and Wildlife 2004).

Distribution

The fisher is found in North America, from the mountainous areas in the southern Yukon and Labrador Provinces in Canada southward to central California and Wyoming, the Great Lakes and Appalachian regions, and New England (Nowak and Paradiso 1983). In California, the subspecies *M. p. pacifica* occurs in the northern Coast Ranges and Klamath Province at elevations of 82 to 3,280 ft (Golightly *et al.* 1997), and occurs sympatrically with the marten (*Martes americana*) in the southern Sierra Nevada at elevations of 5,000 to 8,500 ft in mixed conifer forests (Zielinski *et al.* 1996). The fisher historically occurred in the Lassen, Plumas, Tahoe, Lake Tahoe Basin, El Dorado, Stanislaus, Sierra, and Sequoia NFs, but was not known to occur in the Modoc, Inyo or Humboldt-Toiyabe NFs. Fishers in the Sierra Nevada currently appear to occupy less than half of their historic range (Zielinski *et al.* 1997). Recent surveys indicate that fisher are absent from their former range for a distance of almost 240 miles in the central and northern Sierra, from Yosemite National Park northward (Zielinski *et al.* 1995). This gap in distribution may be effectively isolating the existing southern Sierra Nevada population in the Sequoia NF and a portion of the Sierra NF, from the remainder of the fisher's range in California, Oregon, and Washington. The southern Sierra Nevada population is the species' southern extent of its range.

Fisher populations are presently small or absent throughout most of their historic range in Montana, Idaho, Washington, Oregon, and California (Heinemeyer and Jones 1994). In recent decades, a scarcity of sightings in Washington, Oregon, and the northern Sierra Nevada may indicate fisher extirpation from much of this area (Aubry *et al.* 1999, Carroll *et al.* 1999, Zielinski *et al.* 1996). The Sierra Nevada and northwestern California populations appear to be the only natural populations of fishers in the Pacific region from southern British Columbia to California (Zielinski *et al.* 1997). Mortality rates of adult female fishers in the southern Sierra Nevada population appear to be high (Truex *et al.* 1998). No empirical population estimates are available for California, but fishers are considered rare. Because fishers occur at lower elevations than martens, they are more likely to be directly affected by human activities.

Although no population size estimates have been published, the population is likely to be no less than 100 and probably no more than 500 individuals (Lamberson *et al.* 2000). Monitoring for the Sierra Nevada Forest Plan Amendment includes surveys of suitable habitats within the range of fisher on the Sequoia, Inyo, Sierra and portions of the Stanislaus NFs. Neither Sequoia and Kings Canyon nor Yosemite National Parks have formal monitoring programs for fisher or other mature forest mesocarnivores. Based on this monitoring, it appears that fisher in the Sierra NF are well distributed but occur at lower densities than are observed farther south. Fisher detections were recorded at 20.3% and 17.3% of Sierra NF monitoring stations in 2002/2003 and 2004/2005, respectively (Rick Truex, USFS, pers. comm. 2006). In both 2003 and 2004, using mark-resight methods, the density of fishers within the KRP area was estimated to be 10 per 24,700 acres; this is on the low end of densities reported in similar studies of fishers (Mark Jordan, University of California, pers. comm. 2006).

In the Sequoia NF south of Sequoia National Park, monitoring detected fishers at 38.5% and 38.9% of the sampling points in 2002/2003 and 2004/2005, respectively (Rick Truex, USFS, pers. comm. 2006). The Kern Plateau, west of the Kern River has supported a stable population in the past but detections appear to be shifting to the north and east after the Manter (2000) and McNally (2002) fires. There were fisher detections adjacent to the McNally fire in the fall after the fire, but detections on the west side of the Plateau have been lacking since that time. The Stanislaus NF is monitored to detect northward movement; however, no detections have yet been recorded. The Inyo NF has a few detections mostly in areas that were burned in the McNally fire. Recent monitoring indicates some additional detections adjacent to the Sequoia NF that may reflect shift in the fisher sub-population to adjust for the McNally Fire.

Population status

Fishers have been studied and monitored within the KRP since the mid-1990's (Boroski *et al.*, 2002; Mazzoni 2002; Zielinski *et al.* 1997, 2005; Rick Truex, USFS, pers. comm. 2006; Mark Jordan, University of California, pers. comm. 2006). In addition to Forest Service inventory and monitoring work and Mark Jordan's studies of fisher population density, Amie Mazzoni conducted her master's thesis research in this area, radio-tracking fishers and determining the habitat characteristics of their resting sites (Mazzoni, 2002). Although Mazzoni (2002) documented many rest sites throughout the KRP area, to date no den sites have been identified in the KRP.

Based on extensive track plate and camera surveys (1997-present) in the Region 5 Status and Trend Monitoring Program and the systematic surveys coordinated by Bill Zielinski from 1996-2002, the following observations can be made about the population (Rick Truex, USFS, pers. comm. 2006):

1) Fisher currently appear to be limited in distribution from approximately the southern extent of the Sierra Nevada in Kern County (Greenhorn Mountains and Kern Plateau) to Yosemite National Park.

2) Fishers appear to be absent from the Stanislaus NF, and the northern extent of the population

in Yosemite National Park is not well defined. It appears fisher do not occur north of State Highway 120 in Yosemite NP.

3) Within the southern Sierra population, fishers occur on the west slope of Sierra and Sequoia NFs as well as on the Kern Plateau portion of Sequoia NF (and southernmost Inyo NF).

4) Patterns of detections within the southern Sierra Nevada fisher population suggest the following:

> a. Fisher are well distributed on the west-slope Sequoia NF, from the Kings River south through the Greenhorn Mountains. Annual rates of occupancy (i.e., proportion of sites sampled that detected fisher) are generally consistent, and the spatial distribution of detections is more consistent from year to year than elsewhere in the southern Sierra. This area has been consistently occupied since surveys began in earnest during the early 1990s.
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> b. Recently the detection rate of fisher on the Sierra NF is roughly half what it is on the Sequoia NF. Fisher may have increased their spatial distribution on Sierra NF since the mid-1990s. The annual occupancy rate within Sierra NF seems to be consistent, though the spatial pattern of detections appears more variable among years than on the Sequoia NF. Mark-recapture data collected over the last several years estimate the density of fisher in the KRP area at approximately 1 per 2,500 acres (Mark Jordan, University of California, pers. comm. 2006).
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> c. Fisher still occur on the Kern Plateau following the McNally fire of 2002. The long-term effects of the McNally fire on the fisher population are unknown. Surveys conducted by Region 5 and Sequoia NF suggest fishers are absent or reduced in distribution in the southern portion of the Kern Plateau, but have been detected on northern portion of the plateau at several locations. Occasional detections in the southern half of the plateau have been observed.

Diet

Fishers are opportunistic predators with a diverse diet; which includes birds, porcupines (*Erethison dorsatum*), snowshoe hares (*Lepus americanus*), squirrels, mice, shrews, voles, insects, deer carrion, vegetation and fruit (Martin 1994, Powell 1993, Zielinski *et al.* 1999). Fishers in the southern Sierra Nevada and northern California utilize substantially different prey than fishers in other parts of the country (Zielinski *et al.* 1999). Although mammals were the most frequent prey found in fisher scat in southern Sierra Nevada populations, reptiles constituted a major prey item, occurring in 20.4% of all observed scat (Zielinski *et al.* 1999). Pacific fishers also may feed on hypogeous fungi (false truffles) (Grenfell and Fasenfest 1979, Zielinski *et al.* 1999). Fishers hunt in forested habitats and generally avoid openings (Zielinski *et al.* 1999).

Reproduction

Fishers are solitary animals except during the breeding season which extends from late February to mid-April. Beginning in March, males are more active and roam beyond the limits of their territories in search of females (Arthur and Krohn 1991; Powell 1993). Fishers are likely polygynous and may be polyandrous (Powell 1993). Fishers have a low annual reproductive capacity. Females breed at the end of their first year, but because of delayed implantation do not produce a litter until their second year. One year old males are capable of breeding, but some researchers have questioned whether they are effective breeders at this age (Powell 1993). Litter sizes generally range from one to four, but can be as high as five or six (Powell 1993). Fishers do not always produce young every year. From 2000-2004, on average 40% (range: 18-60%) of females captured in the KRP area showed evidence of having recently given birth (Mark Jordan, University of California, pers. comm. 2006). Truex *et al.* (1998) documented that, of the females in their study area in Sequoia NF, about 50 to 60% successfully gave birth to young. In their study area on the North Coast, however, 73% of females gave birth to young in 1995, but only 14% (one of seven) did so in 1996, indicating fisher reproductive rates may fluctuate widely. In their population viability analysis Lamberson *et al.* (2000) considered 40-60% of females reproducing low values.

Kits are altricial with closed eyes and ears and are raised entirely by their mothers. By the time they are two weeks old, light silver-gray hair covers the body and by 10 weeks kits wean (Powell 1993). After about four months, the mother begins to show aggression towards the kits and by one year the kits have established their own home range (Powell 1993).

Home Range

Fishers have large home ranges, with those of males considerably larger than those of females (Buck *et al.* 1983; Kelly 1977; Truex *et al.* 1998; Mazzoni 2002; Zielinski *et al.* 2004b). In the KRP area of Sierra NF, home ranges of females and males averaged 2,944 and 5,419 acres, respectively (Mazzoni 2002). In Sequoia NF, female home ranges averaged 1302 acres and males averaged 7406 acres (Zielinski *et al.* 2004). In coastal northern California home ranges were considerably larger, averaging 3,700 acres for females and 14,343 acres for males (Zielinski *et al.* 1995). Home range size varies with quality of habitat; it is likely that fishers use larger areas in poorer quality habitat and therefore exist at lower densities (Freel 1991; Truex *et al.* 1998; Zielinski *et al.* 2004b). Black oak (*Quercus kelloggii*) is a common constituent of forests occupied by fisher, providing cavities used as rest sites (Zielinski *et al.* 2004a) and acorns used as food by prey of fishers (Zielinski *et al.* 1999). In the southern Sierra Nevada, female fishers may be able to meet their cover and food needs in a smaller area because of the abundance of black oak in the Sierra Nevada Montane Hardwood and Montane Hardwood Conifer types. Females are found at higher densities in the Sierra than the coastal areas, further supporting this conclusion (Zielinski *et al.* 2004b).

In the Sierra NF, comparing female home ranges to randomly selected areas of similar size, Mazzoni (2002) found that female home ranges had a significantly higher proportion of habitat with >80% conifer crown cover, and a significantly lower proportion of habitat with 5-20% conifer crown cover. On the Sequoia NF, Zielinski *et al.* (2004b) found that the Sierran Mixed Conifer, CWHR type 4 stands, and CWHR D (dense; ≥60% tree canopy closure) stands compose the greatest proportion of fisher home ranges. They also noted a high frequency of hardwood-dominated forest types in fisher home ranges. On average, CWHR M (moderate; 40-<60% tree canopy closure) habitats constituted 20% of the female home ranges and 26% of the male home ranges. Zielinski *et al.* (2004b) also noted that home ranges rarely contained <5% CWHR class 5 (>24 in dbh). They also found that males included more red fir and less ponderosa pine types in their home ranges than females, indicating greater use of the higher elevation portions of the study area than females. Female home ranges occupied the more productive, lower-elevation portions of the study area where the ponderosa pine type is most common. Thus, to access females, males may often have to cross one or more high elevation ridges.

Habitat Use

Fishers in the western United States are habitat specialists associated with mature and late-successional forests with an abundance of large trees, snags and logs (greater than 39 in), conifers and oaks with broken tops and cavities, coarse woody-debris, multiple canopy layers, high canopy closure, and few openings (Aubry and Houston 1992; Buck *et al.* 1994; Buskirk and Powell 1994; Dark 1997; Freel 1991; Jones and Garton 1994; Powell and Zielinski 1994; Seglund 1995; Truex *et al.* 1998; Zielinski 1999). The fisher is among the most habitat-specific mammals in North America, and changes in the quality, quantity, and distribution of available habitat can affect their distributional range (Buskirk and Powell 1994). Forest type is probably not as important to fishers as the vegetative and structural aspects that lead to abundant prey populations and reduce their vulnerability to predation (Powell 1993). In general, fishers use forest or woodland landscape mosaics that include conifer-dominated stands, and avoid entering open areas that have no overstory or shrub cover (Buskirk and Powell 1994). They select forests that have low and closed canopies. Late-successional coniferous or mixed forests provide the most suitable fisher habitat because they provide abundant potential den sites and preferred prey species (Allen 1987).

Recent surveys have detected fishers from Yosemite National Park south through the Greenhorn Mountains in a variety of habitats ranging from low elevation mixed chaparral habitats on the fringe of the forest matrix into red fir (*Abies magnifica*) forests. However, most detections have occurred in mid-elevation habitats including montane hardwood, montane hardwood-conifer, mixed conifer and ponderosa pine (*Pinus ponderosa*) forests (Lamberson *et al.* 2000).

Fishers use large areas of primarily coniferous forests with fairly dense canopies and large trees, snags, and down logs. A vegetated understory and large woody debris appear important for their prey species. The following CWHR forest types are important to fishers: 4M, 4D, 5M, 5D, 6 (multilayered forest with CWHR type 5 over type 3 or 4 and with ≥60% canopy closure) in ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, aspen, red fir, Jeffrey pine, lodgepole pine (*Pinus contorta*), subalpine conifers, and eastside pine habitats (Timossi 1990).

At a landscape scale, patches of preferred habitat and the location of open areas with respect to these patches may be critical to the distribution and abundance of fishers in an area (Buskirk and Powell 1994). Fishers will probably use patches of preferred habitat that are interconnected by other forest types, whereas they will not likely use patches of habitat that are separated by large open areas (Buskirk and Powell 1994). Freel (1991), through his synthesis of available literature and discussions with furbearer researchers, stated that, based on the professional judgment and field observations of California researchers, fishers generally avoid large openings, but may use small openings if good ground canopy, other low closed canopy (>30%), downed woody material, and single or small groups of standing trees are present to provide cover. Koehler and Hornocker (1977), Hargis (1981), and Spenser (1981) reported that marten rarely venture over 150 ft from cover and optimum openings should not exceed 300 ft in width for marten use. Riparian corridors (Heinemeyer and Jones 1994) and forested saddles between major drainages (Buck 1983) may provide important dispersal habitat or landscape linkages (travel corridors) for the species. Riparian areas are important to fishers because they provide important rest site elements, such as broken tops, snags, and coarse woody debris (Seglund 1995).

The details of what is or is not foraging habitat are not well known. Truex and Zielinski (2005) analyzed data from baited track plates to create a model describing foraging site use in the southern Sierra Nevada. They found that resource selection probability functions based on habitat characteristics at stations where fishers were detected were significantly higher than for stations with no fisher detections. The model predicting foraging habitat included positive effects of average canopy cover, average hardwood dbh, presence of conifer snags >40 in dbh, presence of water, and slope; the effects of hardwood basal area, average dbh, and maximum dbh were negative. However, none of these variables was a strong predictor. Comparing plots before and after fuels treatments, they found that the estimated probability of use as foraging habitat was relatively insensitive to the treatments. This is in strong contrast to the treatment effects on probability of use as resting habitat.

Rest sites

Rest site structures used by fishers include: hollow logs; tree cavities; rocks; snags; ground burrows; fallen trees; canopy of live trees, commonly in witches brooms; and slash and brush piles (Heinemeyer and Jones 1994). Fishers appear to re-use rest structures infrequently. In two studies in the southern Sierra Nevada, less than 10% of relocations of radio-tracked fishers were in previously used structures (Mazzoni 2002; Zielinski *et al.* 2004a). These observations suggest that individual fishers use a large number of resting structures during their lives.

In California, trees are the most commonly used rest structures. In Sierra NF, live trees were the most common rest structures used by fishers and snags were the second most commonly used structure (Mazzoni 2002). Ponderosa pine, white fir, and black oak were the three most commonly used rest structures, and the average size of live rest trees was 37 in dbh (Mazzoni 2002). Buck (1983) reported that rest site trees were >25 ft tall, with diameters of 19 to 67 in. In Sequoia NF Zielinski *et al.* (2005b) found fishers resting in live hardwoods 12 to 59 in dbh (mean 26 in dbh), live conifers 12 to 170 in dbh (mean 43-in dbh), and conifer snags 18 to 129 in dbh (mean 47 in dbh). In Sequoia NF, oak and white fir were the tree species most frequently used for resting (Truex *et al.* 1998). Down logs greater than 30-in maximum diameter accounted for approximately 85% of all logs used as rest sites (Truex *et al.* 1998), indicating the importance of large woody debris in the forest habitat. Zielinski *et al.* (2004b) found that females used cavity structures more often than males, while males used platform structures significantly more than females. The diversity of types and sizes of rest structures used by males suggested that males were less selective than females.

Mazzoni (2002) and Zielinski *et al.* (2004b), comparing rest sites with randomly selected locations in the same southern Sierra Nevada forest stands, found significant differences including higher canopy cover, higher crown volume, canopy layering in stands with >60% cover, more log cover, more standing basal area, more large snags, and closer proximity to streams. Mazzoni (2002) found that Sierra NF rest sites had an average canopy cover of 72.8% and randomly selected sites an average 55.7%. In the areas of Sequoia NF where Zielinski *et al.* (2004b) radio-tracked fishers, both resting sites and random sites had average canopy closure of >90%. In the Sierra NF study rest sites and random sites had average basal areas of 302 and 215 ft^2 per acre, respectively (Mazzoni 2002). In Sequoia NF, both resting and random sites had average basal areas of approximately 270 ft2 per acre (Zielinski *et al.* 2004a). Both studies scored resting sites higher than random sites for large snags. Both studies also found proximity to surface water to be significantly associated with rest site use. In Sierra NF, rest sites and random sites were on average 376 ft and 527 ft from permanent streams, respectively (Mazzoni 2002). In Sequoia NF, 51.9% of resting sites and 27.8% of random sites were within 333 ft of surface water (Zielinski *et al.* 2004a).

Zielinski *et al.* (2004b) present a model which estimates the relative likelihood that a fisher will select a given site. They caution that "the objective of recruiting and retaining large trees should not overshadow, however, the goal of encouraging structural diversity; standard deviation of dbh was included in the Sierra model. This observation suggests that developing stands that include variation in the size of trees may be beneficial. We agree with Weir and Harestad (2003) that the maintenance of large structural elements at small scales may mitigate for the negative effects of large-scale alterations of habitat. However, we cannot at this time recommend standards for the optimal distribution of resting-structure types across a landscape."

In a study comparing the effects of a range of fuels treatment options on predicted habitat suitability for fisher, Truex and Zielinski (2005) found that mechanical and mechanical plus fire treatments significantly reduced estimated resting habitat suitability when compared with controls, but suitability following fire only treatment was not significantly different from controls. They concluded that the effect resulted mainly from a reduction of canopy cover which should recover relatively rapidly in thinned stands.

Den sites

Selection of natal (birthing) and maternal (kit raising) dens is highly specific. Habitat components must exist in the proper juxtaposition within specific habitats in order to provide a secure environment for birth and rearing of fisher kits. All known natal and maternal dens in the western United States have been in large diameter coarse woody debris, snags, or cavities of large diameter live conifers or oaks (Powell and Zielinski 1994, Zielinski *et al.* 1995, Truex *et al.* 1998). Female natal and maternal dens are found at mid-slope or lower slope elevations where their home range is located.

Natal dens, where kits are born, are most commonly in tree cavities at heights of greater than 20 feet, while maternal dens, where kits are raised, may be in cavities closer to the ground so active kits can avoid injury in the event of a fall from the den (Lewis and Stinson 1998). Most natal and maternal dens are in large conifers (white fir in southern Sierra, Douglas fir in Eastern Klamath) or oaks (black oak in southern Sierra), which may be live or in snag form (Truex *et al.* 1998). Radio telemetry studies have detected eight fisher natal and maternal dens in the Sierra Nevada. Truex *et al.* (1998) reported dens in live black oaks as small as 17 in dbh and live white fir as small as 32 in dbh in the Sequoia NF. However, within the KRP area, no fisher den sites have been identified.

Yosemite Toad

On December 10, 2002, in a 12-month finding for a petition to list the Yosemite toad, the Service added the toad to the list of candidate species (U.S. Fish and Wildlife Service 2002). Yosemite toads are moderately sized, with a snout-urostyle length of 1.2-2.8 in with rounded to slightly oval paratoid glands (Karlstrom 1962). The paratoid glands are less than the width of a gland apart (Stebbins 1985). Males are smaller than females, with less conspicuous warts (Stebbins 1951). Differences in coloration between males and females are more pronounced in the Yosemite toad than in any other North American frog or toad (Stebbins 1951). Females have black spots or blotches edged with white or cream that are set against a grey, tan or brown background color (Jennings and Hayes 1994). Males have a nearly uniform dorsal coloration of yellow-green to olive drab to darker greenish brown (Jennings and Hayes 1994). The Yosemite toad was originally described by Camp (1916), and given the common name Yosemite Park toad. Subsequent detections of this species indicated that its range extends beyond the boundaries of Yosemite National Park and Grinnell and Storer (1924) referred to this species as the Yosemite toad.

Feder (1977) found Yosemite toads to be genetically distinctive based on samples from a limited geographic range. However, Yosemite toads are thought to hybridize with western toads in the northern part of their range (Karlstrom 1962; Morton and Sokolski 1978). Shaffer *et al.* (2000) performed genetic analysis of a segment of mitochondrial DNA which showed significant genetic differences in Yosemite toads between Yosemite and Kings Canyon National Parks. They also found significant genetic variability between drainages within Yosemite National Park and within both Parks between breeding sites. Stephens (2001) examined mitochondrial DNA from eight Yosemite toads and 173 western toads. Stephens' data indicate that toads in the Sierra Nevada occur in northern and southern evolutionary groups, each of which include both Yosemite and western toads.

Distribution

Yosemite toads occur in the central Sierra Nevada of California at elevations from 6,000 to 11,910 ft (Stebbins 1985). Populations are patchily distributed in suitable habitat from the Blue Lakes region north of Ebbetts Pass (Alpine County) south to Spanish Mountain in Sierra NF (Fresno County). The vast majority of land within the range of the Yosemite toad is federally managed, with 2,270,918 acres (99% of the range) on U.S. Forest Service, National Park Service, or Bureau of Land Management lands. Much of this land is within designated wilderness. The remaining land within the species' range is a mix of State, local government, and private lands.

Population Status

Since 1990, Yosemite toads have been documented at approximately 600 sites: 313 meadows in Sierra NF; 80 meadows in Stanislaus NF; 35 sites in Inyo NF; 15 sites in Toiyabe NF; 3 sites in El Dorado NF; 74 lakes and ponds and 63 wet meadows in Yosemite NP; and 14 sites in Kings Canyon NP. Available data suggest that most of these sites represent small breeding populations of 1-30 breeding adult females.

Several researchers that have resurveyed historically occupied Yosemite toad sites report the absence of toads from many of these sites. Drost and Fellers (1996) resurveyed sites where Yosemite toads were observed by Grinnell and Storer (1924) in 1915 and 1919. They found that Yosemite toads were absent from 6 of 13 sites where they had been found in the original survey. Jennings and Hayes (1994) reviewed the current status of Yosemite toads using museum records of historic and recent sightings, published data, and unpublished data and field notes from biologists working with the species. They mapped 55 historically documented general localities throughout the range of the species and found evidence that Yosemite toads were present at 26 of those localities, a decline of over 50%. The only historic data on population size come from Sherman and Morton (1993) who reported >200 breeding males at one site and smaller numbers at other sites in the 1970's. From 1996 to 2001, Walter Sadinski (U.S. Geological Survey, pers. comm. 2004) annually counted egg masses at 63 sites in Yosemite NP and always found <30 egg masses per site. He also reported shifting occupancy in some breeding sites, with breeding toads present in some but not all years.

An ongoing effort by the U.S. Forest Service is monitoring amphibians in 94 basins encompassing the ranges of both the Yosemite toad and the Sierra Nevada mountain yellow-legged frog (*Rana muscosa*). In surveys conducted in 2002, 2003, and 2004, Yosemite toads were detected in 75-85% of the basins where this species has been observed since 1990. In the 16 basins sampled for more than one year, ten basins had toads detected in all years, four basins had toads detected in some years, and two had no toads detected (Kathy Brown, USFS, pers. comm. 2005).

Within the KRP area there are 252 acres of meadow habitat occupied by Yosemite toads; 120 acres of this occupied habitat is located on private land. Of the 132 acres of occupied meadow habitat within KRP management units, 22 acres are in control units. The eight management units contain 22 acres total of occupied meadows, all situated in the "KREW (Kings River Experimental Watershed) Bull 1" management unit. Between 2002 and 2005, Yosemite toads were documented breeding in six meadows within the "KREW Bull 1" management unit; six additional meadows never had any indication of Yosemite toad breeding.

Diet

Adult and juvenile Yosemite toads are ambush predators. They remain motionless until a prey item approaches, then strike and capture the prey with their sticky tongues (Kagarise Sherman and Morton 1984). The examined stomach contents of Yosemite toads have included beetles, ants, centipedes, spiders, dragonfly larvae, mosquitoes, and moth and butterfly larvae (Grinnell and Storer 1924; Mullally 1953). They will also prey on flies, bees, wasps, millipedes (Kagarise Sherman and Morton 1984), spider mites, crane flies, springtails, owl flies, and damsel flies (Martin 1991).Yosemite toad tadpoles graze on detritus and plant material such as algae and will also eat other items such as lodgepole pine pollen. Yosemite toad tadpoles can also be carnivorous and will eat other Yosemite toad tadpoles, Pacific chorus frog (*Pseudacris regilla*) tadpoles, diving beetle larvae, and dead mammals (Martin 1991).

Reproduction

Males have been observed to first breed at 3 to 5 years and females at 4 to 6 years (Kagarise Sherman 1980; Kagarise Sherman and Morton 1984). Females probably do not breed every year (Morton 1981). Yosemite toads are long lived, with females documented as reaching 15 years old and males 12 years old (Kagarise Sherman and Morton 1984). Yosemite toads typically breed in wet meadows or shallow portions of larger wetland complexes. Emergence from winter refuges is dependent upon the timing of snow-melt, and thus varies from year to year. Breeding has been reported from early May to late July (Kagarise Sherman 1980; Walter Sadinski, U.S. Geological Survey, pers. comm. 2004).

Females are estimated to deposit between 1,000 to 1,500 eggs (Kagarise Sherman 1980). Eggs are typically deposited in shallow water bodies with silty bottoms (Karlstrom 1962). Ideal habitat for egg development is between 0.8-1.6 in deep, and eggs do not survive in water deeper than 2.4 in (Dave Martin, University of California, Santa Barbara, pers. comm. 2002). Eggs generally hatch within 3 to 6 days (Jennings and Hayes 1994), but may occasionally require over 15 days (Kagarise Sherman 1980). Tadpoles typically transform 40 to 50 days after egg deposition.

Habitat

Yosemite toads breed in wet meadow habitats, small pools and ponds, slow flowing streams, and the shallow edges of larger wetlands (Mullally 1953; Jennings and Hayes 1994; Walter Sadinski, Sadinski, U.S. Geological Survey, pers. comm. 2004). Breeding sites are often surrounded by lodgepole (*Pinus contorta*) or whitebark (*P. albicaula*) pines (Camp 1916). Occupied meadows typically have thick meadow vegetation or patches of low willows (*Salix* spp.) (Mullally 1953). Yosemite toads are most often encountered near water, but only occasionally in water (Mullally and Cunningham 1956). Both during the summer and winter, Yosemite toads appear to occupy rodent burrows extensively (Karlstrom 1957; Jennings and Hayes 1994). They also use spaces under surface objects, including logs and rocks, for temporary refuge (Stebbins 1951; Karlstrom 1962). Moist upland areas such as seeps and springheads are important summer non-breeding habitats for adult toads (Dave Martin, University of California, pers. comm. 2002, 2006). These areas are typically dominated by willows and lupines or in small forest clearings.

Because Yosemite toads breed when much of the landscape is still covered with deep snow, a critical resource for populations appears to be overwintering sites that are free of snow when open water forms in breeding areas (Kagarise Sherman and Morton 1984; Walter Sadinski, U.S. Geological Survey, pers. comm. 2004). Kagarise Sherman (1980) identified a dense patch of willows that was apparently used as an over-wintering hibernaculum by a large number of Yosemite toads, although not all toads over-wintered here. She observed adult toads emerging from this area, moving down-slope and crossing a large snowdrift to access a breeding area 495-760 feet away. Kagarise Sherman (1980) also observed that many newly metamorphosed toads apparently spent their first winter in burrows closer to the breeding sites than adults. After breeding, adults moved away from the breeding area and occupied moist willow clumps and drier hillsides. For marked toads, the mean maximum distance moved from the breeding site was 683 and 585 ft, for females and males, respectively (Kagarise Sherman 1980). However, Yosemite toads are capable of longer distance movements.

Dave Martin (University of California, pers. comm., 2006) studied Yosemite toads in the Highland Lakes region of Stanislaus NF, elevation approximately 8000 ft. The adults in Martin's study area overwintered exclusively in burrows in lodgepole pine forest. All six adults that he tracked to overwintering burrows, occupied sites less than 33 ft from the edge of the forest and situated on gentle slopes. The areas of forest occupied bordered either a meadow or the "sagebrush" belt which directly bordered a meadow. Although overwintering sites were near forest edges, toads whose movements he tracked traversed extensive areas of forest when moving between sites. Martin observed adult Yosemite toads moving up to approximately 5000 ft away from the meadow where they bred. Movements through forest occurred most commonly at night and following rainfall events.

Published radio tracking studies of the closely related boreal toad (*Bufo boreas boreas*) in montane habitats above 6000 ft elevation in Idaho and Colorado, indicate that these animals are also capable of long distance movements. In Idaho the mean maximum distance traveled from the breeding site was approximately 3650 and 1920 feet for females and males, respectively (Bartelt *et al.* 2004). In Colorado the mean maximum distances traveled were 2990 and 1525 feet, for females and males, respectively (Muths 2003). Between these two studies 32 toads were tracked, one of which moved 7920 ft (1.5 miles) from the breeding site.

Effects of Action

Section 9 of the Act and its implementing regulations prohibit the "take" of federally listed fish and wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect..." any listed animal species by any person subject to the jurisdiction of the United States. "Person" is defined as an individual, corporation, partnership, trust, association, or any other private entity, as well as any agency or employee of the federal government, a state or local government, or foreign government. "Harass" in the definition of "take" in the Act means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR §17.3). "Harm" in this definition includes significant habitat modification or degradation where it actually kills or injures wildlife, by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR §17.3). Although the fisher and Yosemite toad are candidate species and thus not covered under the take prohibitions of the Act, for the purposes of this effects analysis we use the terms "harass" and "harm" as they are defined in 50 CFR §17.3.

Fisher

In the DEIS, the Forest Service concludes that the implementation of the project in the first eight management units "may affect individual fishers, but is not likely to lead to federal listing or loss of viability" for this species. We agree that the project as currently proposed is likely to affect fishers and that the protection measures proposed will reduce the effects.

Direct and Indirect Effects – In the DEIS, suitable fisher habitat is defined as CWHR types 3D, 4M, 4D, 5M, and 5D at elevations ranging from 3500 to 8500 feet. The eight units currently have 9,760 acres of suitable habitat. Extrapolating from Jordan (2006), this area of suitable habitat could support approximately four fishers. However, because the management units are dispersed across the 131,500 acre KRP area, it is likely that these eight management units include portions of the home ranges of a larger number of fishers. Using the DEIS estimate that there are currently 33,187 acres of suitable fisher habitat within the KRP management units, we estimate that up to approximately 13.4 fishers may be affected by the project to a greater or lesser extent.

The protection measures proposed for the fisher will provide some protection from harm and promote the recovery and development of suitable fisher habitat. Measure #1 (see Description of the Proposed Action above) states that the long-term project goal is to maintain >50% of the landscape in CWHR type 4 or greater with at least 50% canopy cover, or to maintain 50% of lands outside of WUI with canopy density >60%. This goal should ensure the maintenance and recovery of fisher foraging and dispersal habitat, however, because rest and den sites in the Sierra Nevada average >70% to >90% canopy cover its effect on these uses cannot be evaluated. Measure #2 will reduce the likelihood that denning fishers will be harassed or harmed by prescribed burning. Measure #3 establishes a commitment to protect resting and denning-type structures and associated density in areas outside of WUI. Measure #4 protects large trees of the size typically used for resting and denning throughout the project area, but does not address the requirement for canopy density. Measure #5 refers to the system of OFLs that will be maintained along streams to enhance habitat connectivity. Finally, measure #6 requires monitoring fishers in treatment and control units.

Fishers may be directly harmed by the removal of potential rest or den trees. The risk to fishers depends on the proportion of resting-size trees that will be harvested within any individual fisher's home range. The risk to fishers is mainly from harvesting conifers 12-34 in dbh. Because many trees of resting size class will not be harvested, because management units are generally smaller than fisher home ranges, and because fishers are present at low densities, the probability of directly harming or killing a fisher during harvest is not high. However, without additional information on the numbers and sizes of trees to be harvested and to be left uncut, a more accurate estimate of this threat is not possible.

Smoke and fire from prescribed burns on 4,685 acres could also harm, harass or kill fishers in the area. Because prescribed fire should not consume resting-size class trees, and snags and large logs will be protected during prescribed burning through the use of firing patterns and placement of fire lines to minimize effects on these resources (DEIS, p. 53), the direct effects of prescribed burning on fishers is generally expected to be small. Also, by conducting burning outside the fisher denning period of mid-March to mid-May, to the extent practicable, the potential effects will be minimized.

The eight management units currently contain 3,416 acres CWHR types 4D and 5D, which will be reduced to 2,418 acres (35 in alternative) or 2,515 acres (30 in alternative) after treatment. Acreage of CWHR type 4M and 5M will increase from the current 5,635 acres to 5,717 acres (35 in alternative) or 5,687 acres (30 in alternative). Because the available research indicates that fishers preferentially select forested habitats with >70% canopy density and multi-storied canopies, the effect of reducing the area of CWHR type 4D and 5D forest by 29%, while maintaining ¼ to 2 acre pockets of suitable high density habitat, cannot be predicted with certainty. In these eight units 6830 acres are in WUI and DFPZ, and 557 of these acres (5%) will be changed to habitat types unsuitable for use by fishers (i.e., not 5D, 4D, 5M, 4M, or 3D).

Over the 30 years following the initial treatments, habitat will recover and the acres of CWHR type 4D and 5D habitats are predicted to increase. Whereas there are currently only 77 acres of CWHR type 5D habitat, 30 years after treatment 383 (35 in alternative) or 421 (30 in alternative) acres of 5D are predicted. Similarly, CWHR type 4D currently totals 3,338 acres, but 30 years after treatment 4,446 (35 in alternative) or 4,405 (30 in alternative) acres of 4D are projected. However, the models predict that CWHR type 4D acreage will be at or below current levels for more than 20 years after treatment.

Many of the activities proposed for the KRP have the potential to harass or harm fishers, causing animals occupying treated areas to move away from the project areas (DEIS, p. 195) and avoid them for an undeterminable period of time, or at a minimum altering their normal patterns of movement and foraging. Mechanical treatment of 9,751 acres within the eight units will substantially modify the vegetation and disturb the majority of habitat suitable for and likely occupied by fishers. Vegetation removal, noise and the physical presence of machinery and personnel for harvesting and fuels treatment operations are likely to harass fishers. Fishers may also leave areas of prescribed burning in response to smoke and fire. The ultimate effect on fishers of disturbance and potentially forced migration is unknown, but is unlikely to be wholly beneficial. Because management units are designed to be smaller than most fisher home ranges, it is conceivable that displaced individuals will shift their activities to portions of their home range outside of the disturbed areas; however, some may be displaced into unfamiliar territory. Fishers stimulated to migrate by project activities may have to move through or arrive in less suitable habitat where risk of mortality due to predation or physiological stress will likely be higher. Some fishers may remain in treated management units or return soon after treatment. These individuals are likely to be harmed by reduced habitat suitability and reduced availability of their small vertebrate prey base. They may be harmed if den trees are harvested and thus suitable sites for breeding no longer remain, or if availability of resting sites is substantially reduced.

Disturbance may also increase the density of fishers in untreated areas. The temporal extent of these effects cannot be predicted with confidence, but model projections of habitat development suggest that effects will persist for between 10 and 20 years. Because the KRP area is bounded by the San Joaquin and Kings rivers, which are thought to restrict dispersal, increased density in undisturbed habitat is expected. Assuming that during treatments fishers move from the eight units (9,760 acres) to untreated suitable habitat in the KRP (24,000 acres), the density of fishers in these areas will be increased by approximately 41% overall. To acquire adequate resources, fishers may have to shift or expand their home ranges, encompassing larger areas of marginal quality habitat. Resource availability (e.g., prey) in adjacent untreated areas will likely decline due to the increased density of animals. Fishers expanding their home ranges into unfamiliar areas are likely to be more vulnerable to mortality from predators, physiological stress, or starvation. Because researchers have found dead fishers apparently killed by other fishers (Truex *et al.* 1998), fishers displaced from treated areas into other fishers' home ranges also may be vulnerable to intraspecific predation. Although this temporary disturbance will affect most of the suitable fisher habitat to some degree, the area that will be converted to habitat unsuitable for fishers is estimated to be approximately 10% of what currently exists.

Stand replacing fire is a constant threat to fishers and their habitat. Model results indicate that following a fire that encompasses all eight management units, the number of suitable acres present will be 2,862 for the no action alternative, 7,160 for the 35 in alternative, and 7,291 for the 30 in alternative. Suitable habitat is also predicted to develop more quickly post-fire with the 30 and 35 in alternatives.

Cumulative Effects – Outside of the eight management units, but within the KRP area, there are approximately 24,000 acres of suitable fisher habitat. Over the past 10 years many prescribed burns have been conducted within the KRP area. The purposes of these prescribed burns were to reintroduce fire into the area, to maintain DFPZs, and reduce ground fuels. Prescribed burns in the past and projecting into the future affect 17,300 acres within the KRP. Pacific Gas and Electric's Helms/Gregg 230 kV transmission line right of way traverses the southern portion of the KRP, occupying approximately 371 acres. Right of way maintenance involves herbicide application, brush cutting, and hazard tree removal to maintain a cover of low growing natural species. In 2005, approximately 500 trees <10 in dbh, 324 trees 10 in-30 in, and 206 trees ≥30 in dbh were removed for right of way maintenance. Ongoing removal of roadside hazard trees along roads used by the public and the Forest Service removes damaged, dead or weakened trees from areas within 300 ft of roads. In 2004 and 2005 these activities harvested 1,734 trees from the KRP (4.7 million board ft), 629 of which were >30 in dbh. These activities have the potential to take fisher and make forested areas within 300 ft of roads less suitable habitat.

Activities on private lands within the KRP also affect fishers and their habitat. Southern California Edison harvests approximately 1,500 acres of timber each year from their lands. The entire property will be treated in 10-15 years. Typical prescriptions use an uneven aged silvicultural system, with no size limit on the trees harvested, and removal of approximately 30% of standing stem area. It is estimated that canopy cover typically remains above 50%. The private Grand Bluff property owners have a cooperative fuels reduction grant to remove and shred brush and plant conifers on 80 acres adjacent to the "KREW Providence 1" and "Providence 4" management units (as defined in the DEIS). Recently completed or ongoing tree thinning on the Grand Bluff and Twin Ponds properties is also estimated to affect approximately 100 acres. Development of single family homes on 160 acres of recently harvested forest along the western project boundary will permanently convert this area to non-forested habitat.

Conservation Recommendations – Although fishers appear well distributed in the Sierra NF, monitoring data suggest that fishers are approximately half as dense here as in the Sequoia NF and other population parameters suggest marginal population status (Lamberson *et al.* 2000). Available data suggest that high quality habitat for fishers, especially forest with canopy cover >60%, is present at lower densities in the KRP area than in Sequoia NF. Consistent with lower habitat quality in the KRP area, the average home range of radio-tracked female fishers was more than twice as large on the Sierra NF as compared with the Sequoia NF (Mazzoni 2002; Zielinski *et al.* 2004b). Comparisons of estimated densities of fishers in the KRP area with similar data collected elsewhere place KRP fisher densities at the low end of values observed in occupied habitat. The proportion of females showing evidence of breeding annually is also at the low end of the documented spectrum (Mark Jordan, University of California, pers. comm. 2006).

Because fishers exist at low densities in this landscape, and because the proposed action will leave essentially all trees larger than 30 or 35 in dbh and many smaller trees, we consider the potential for the KRP to directly injure or kill a fisher to be low. We are, however, concerned that the proposed action has the potential to adversely affect fisher habitat and harass or harm fishers by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

As a candidate species, the status of and threats to the fisher will be reevaluated annually in a Candidate Notice of Review (CNOR). In the most recent CNOR the threats to fisher were evaluated as of high magnitude but as nonimminent and its priority number was maintained at 6 (U.S. Fish and Wildlife Service 2005). This was based on the observation that numbers of fishers in occupied habitat appear to be stable or not rapidly declining. The greatest threat to the fisher was cited as issues relating to small isolated populations and the potential for further loss and fragmentation of habitat over time. To avoid and minimize adverse effects of this project to the fisher we recommend that the project be implemented as described in the "Description of the Proposed Action."

Yosemite toad

In the KRP DEIS, the Forest Service concludes that the implementation of the project on the first eight management units "may affect individual Yosemite toads, and is likely to result in a trend toward federal listing or loss of viability" for this species. We concur the project is likely to adversely affect individual toads, but have determined that the protection measures adopted should minimize the project effects.

Direct and Indirect Effects – Yosemite toads have been documented breeding in six meadows in or adjacent to the "KREW Bull 1" management unit. Because this species has been observed moving up to 0.6 mi from meadows, tractor operations on 457 acres and underburning on an unspecified number of acres within 0.6 mi of occupied "KREW Bull 1" meadows, may harm, harass or kill some Yosemite toads. However, the protection measures proposed will minimize the effects of the project on Yosemite toads. Protection measure #1 specifies that areas within 100 ft of meadow habitats will be avoided completely by heavy machinery, so the project will not likely have adverse affects on breeding Yosemite toads, developing larvae, or newly metamorphosed toadlets, and destruction of overwintering burrows will be reduced. Measure #2 specifies that trees may be felled within 100 ft of meadows, but that around occupied meadows only trees >50 ft from the meadow will be felled and removed by a cable. This measure will minimize the potential for destruction of over-wintering burrows. Measure #3 limits the operating season to the period beginning after breeding and ending by October 1, and also specifies that if rainfall >0.1 in is received operations will cease for 24 hours. This measure will minimize the potential for take by avoiding operations during the times that most toads will be migrating through forested areas. Measure #4 minimizes the potential for harm to toads by specifying that heavy machinery will be kept >50 ft from moist non-meadow habitats where toads appear to concentrate their summer activities. Measures #5 and #6 also minimize the potential for harm by keeping chemical treatments >500 ft from occupied meadows, and prohibiting water drafting within 0.6 mi of occupied meadows.

Because adult Yosemite toads have been documented using overwintering burrows in forest habitat near meadows, limiting felling and endlining of trees to areas >50 ft from occupied meadows will reduce the potential that the project will kill, harm, or harass toads. Beyond the 50 ft avoidance area availability of burrows and other subterranean hibernacula will be reduced for an unknown period of time due to the destruction of mammal burrows and likely killing of many burrowing mammals by tree felling and end-lining.

Road reconstruction, road maintenance, and vehicle traffic within 0.6 miles of occupied meadows have the potential to kill Yosemite toads; however, the magnitude of this threat is thought to be small due to the limited operating season. If these roads will be open to the public, road reconstruction and maintenance will improve roads facilitating additional future use which may kill, harm or harass migrating toads. Improved vehicle access will likely increase off highway vehicle use in the area, and if these vehicles enter meadows, newly metamorphosed and subadult toads will likely be killed, harmed, or harassed, their burrows destroyed, and the suitability of their breeding habitat reduced.

Cumulative Effects - Yosemite toads in the Bull Creek and Tea Kettle watersheds are isolated by approximately 2.5 miles from the next nearest occupied habitat. Because researchers studying this and a related species have observed individuals moving a maximum of 1.5 miles, the subpopulation occupying this area can be considered an independent entity for the purpose of cumulative effects analysis.

Cattle grazing in meadow habitats is recognized as a threat to Yosemite toads and their habitat (USDA Forest Service 2001; U.S. Fish and Wildlife Service 2002). There is a long history of livestock grazing in the Sierra Nevada and extensive damage to Yosemite toad habitat has already resulted; the Patterson Mountain grazing allotment which includes "KREW Bull 1" and the surrounding landscape is still actively grazed by cattle. Where cattle are not excluded from meadows, they can collapse burrows and cause stream erosion/incision; such effects are long-lasting and without restoration possibly permanent. Stream channel incision results in lowering of the water table and earlier drying of wet meadow and non-meadow habitats. Grazing livestock may also adversely affect moist non-meadow vegetation such as willow thickets. Grazing also has the potential to harass, harm or kill individual Yosemite toads by crushing them or entrapping them in burrows.

Recreation is another ongoing land use with potential adverse cumulative effects on Yosemite toads and their habitats (U.S. Fish and Wildlife Service 2002). Off-trail vehicle and foot traffic can collapse burrows and may harass, harm or kill individual Yosemite toads. Public vehicle traffic on roads and trails can kill migrating toads. Although it is not known that disease is an issue in this part of the species range, in a die-off of Yosemite toads near Yosemite NP a wide range of pathogens were found to be present in dead and dying individuals (Green and Kagarise Sherman 2001).

Conservation Recommendations – As a candidate species, the status of the Yosemite toad and its threats will be reevaluated annually in a Candidate Notice of Review (CNOR). In the most recent CNOR, because remaining areas containing Yosemite toad populations occur mainly on federal land, facilitating management by federal agencies, the threats to the this species were rated of moderate magnitude and as nonimminent. Its priority number was maintained at 11 (U.S. Fish and Wildlife Service 2005). Although this project will likely result in the harm, harassment, or death of an unknown number of Yosemite toads, we have determined that the conservation measures proposed by the applicant will substantially avoid and minimize the effects of the project. Because breeding and likely overwintering habitats will be avoided, and because other occupied meadows exist within dispersal distance, the project activities are unlikely to result in the extirpation of this southwestern-most metapopulation of this species. To avoid and minimize adverse effects of this project to the Yosemite toad we recommend the following:

1) Implement the project and conservation measures as specified in the "Description of the Proposed Action"; and
2) The ability to confidently plan projects that avoid harm to Yosemite toads and their essential habitats is limited by a lack of appropriate knowledge. This project provides an opportunity to learn about the effects of timber harvest, mechanical fuels treatments, and underburning on Yosemite toads. We recommend that the FS develop a research and monitoring program to determine the effects of this action on Yosemite toad abundance and habitat use. We recommend that this program include population and habitat monitoring in occupied treatment and control meadows. We recommend that radio tracking of adult and subadult Yosemite toads be employed to determine non-meadow habitat use by this species.

We appreciate your interest in working with us to minimize the effects of the proposed action on candidate species. Please contact Pete Trenham or Roberta Gerson of this office at (916) 414-6600, if you have any questions regarding the Kings River Project.

Sincerely,

Cay C. Goude
Acting Field Supervisor

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PERSONAL COMMUNICATIONS

Fisher

Mark Jordan, University of California, Unpublished data, 2006

Rick Truex, USFS Sequoia National Forest, Unpublished data, 2006

Yosemite Toad

Kathy Brown, USFS Pacific Southwest Research Station. Unpublished data, 2005.

Dave Martin, University of California, Unpublished data, 2002.

Dave Martin, University of California, Unpublished data, 2006.

Walter Sadinski, US Geological Survey, Unpublished data, 2004.