

Pacific Fisher Natal and Maternal Den Study

A Joint Project By
Sierra Pacific Industries and California Department of Fish and Game

Progress Report No. 1
January 9, 2006 to June 9, 2006



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Introduction

In California, the Pacific fisher (*Martes pennanti pacifica*) once occurred in suitable habitat throughout the lower and middle elevations of the Sierra Nevada from northern Kern County to the southern Cascades in Siskiyou County (1000 feet in the north up to 7,000 feet in the south). In northwest portions of the State, fisher ranged from Marin and Lake Counties north to the Oregon border. Recent studies indicate fisher appear to occupy less than half of the area they inhabited in the early 1900s (Zielinski et al. 1995). Currently they likely occur in two effectively isolated populations in the southern Sierra Nevada Mountains and northern California. The population in the northern portion of California is probably the largest in the western United States (Zielinski et al. 2004).

There is considerable interest in fisher populations throughout their range and the U.S. Fish and Wildlife Service (FWS) has been petitioned repeatedly to list various sub-species or populations of the fisher since the early 1990's. In 2004, the FWS determined that listing of the west coast population of the fisher, as defined by the petitioners, was warranted but precluded by higher priority activities.

Considerable research has been conducted to document fisher distribution, home range sizes, habitat associations, and reproduction in northern California. The fisher is known to use a variety of forested stand and landscape conditions in northern California. However, our understanding of fisher in the eastern portion of their range in northern California is comparatively limited. Very little information is available regarding reproductive habitat or the home range characteristics of fisher on privately managed timberlands in the areas included in this study.

The primary purpose of this project is to investigate the occurrence and reproductive habitat of the fisher in eastern portions of the Klamath Province, particularly on industrial timberlands managed by Sierra Pacific Industries (SPI). Results of this study are expected to contribute to our understanding of the status of fisher and supplement existing species-habitat and species-population information that may be used to develop conservation strategies to benefit the species.

This project is a cooperative effort between the California Department of Fish and Game (CDFG) and SPI. It is being conducted on industrial timberlands managed by SPI and Roseburg Resource Company (RRC) in northern Shasta and southern Trinity counties. The timeframe for this study is from Winter 2005-2006 through Spring 2007.

Study Objectives

- Document the presence of adult male, adult female, and juvenile fisher.
- Describe the home ranges of adult female fisher.
- Characterize the reproductive status of adult female fisher.
- Identify natal and maternal fisher dens and characterize the habitat surrounding these sites.
- Characterize the disease status of the captured fisher.

Methods

Fisher residency and reproductive status are being evaluated at two study areas within SPI's and RRC's ownership; the Sacramento Canyon area and the South Weaverville area (Figure 1). These study areas are located outside of the area previously studied by students from Humboldt State University, where residency and reproduction have been established (Seglund 1995; Dark 1997; Truex et al. 1998; Golightly pers. comm., 2005). Work in the Sacramento Canyon area will augment a previous study on the species conducted in this area by SPI.

Prior to commencing trapping operations, selected SPI personnel were provided with a list of specially designated CDFG personnel and their telephone contact information for notification of animal captures and subsequent handling. Only CDFG personnel who have currently completed the Wildlife Investigations Laboratory's Wildlife Restraint Course immobilized and processed captured animals. Animals selected for processing were restrained in a metal cone allow safe handling and effective immobilization. Immobilized fishers were monitored according to the Wildlife Animal Capture Handbook until they were no longer immobile, and released at the capture site.

Fishers were captured using live traps and immobilized with ketamine hydrochloride at the rate of 10-20 mg/kg in combination with xylazine at 1-2 mg/kg, or by using ketamine hydrochloride at the rate of 20 mg/kg in combination with diazepam at 1mg/kg. Wooden boxes were attached to the rear of all live traps to provide a secure area for fisher when captured. Traps were checked daily to minimize the amount of time fisher or other species captured incidentally were confined. The setting and checking of traps was conducted principally by SPI personnel.

Captured fishers were measured, weighed, and implanted with an identification microchip prior to release. Blood, tooth, fecal, and hair samples were collected from animals being processed. Blood samples were provided to Dr. Rick Brown (Humboldt State University, Arcata Ca.) to be examined for, at minimum, the presence of canine distemper virus, parvovirus, and *Anaplasma phagocytophilum*.

Over the course of the study, up to 20 female fishers will be fitted with VHF telemetry collars (Advanced Telemetry Systems Model Number M1930) with approximately half of the radio-collared animals to be distributed within each study area. After release, radio-collared fishers were relocated 2-4 times weekly to establish movement patterns and detect the onset of parturition. During the period of birthing and nursing kits, animals will be relocated 3-5 times weekly to determine the location of natal and maternal dens. Natal and maternal dens will be documented by observations of kits or consecutive, repeated re-use of the same den structure over time. Should a study animal die during this project and its carcass recovered, the remains will be transported to the CDFG Wildlife Investigations Laboratory for necropsy.

Maternal and natal dens were physically identified in the field and their locations recorded. Information regarding den characteristics, stand and landscape conditions at den sites will

be collected. For each female with sufficient data, core areas within the home range (using adaptive or fixed kernel approach) will be identified and vegetation plot data will be used to characterize the core or high use areas.

Every effort will be made to minimize disturbance to study animals at den or rest sites. Measures to that end will include talking only when necessary, minimizing the number of people in the field, and minimizing the time spent at occupied sites. Data characterizing individual dens and surrounding habitats will not be collected until radio-collared fishers have departed from the site.

Work Products

- Progress Report: To be submitted at least annually to the CDFG Wildlife Programs Branch.
- Final Report: To be submitted to the CDFG Wildlife Programs Branch at project completion (December 2007).
- GIS Database: To be archived and made available to CDFG Wildlife and Habitat Data Analysis Branch.

Primary Participants

California Department of Fish and Game: Richard Callas, Scott Hill, Pete Figura, and Bob Schaefer

Sierra Pacific Industries: Steven Self, Julie Kelley, Matt Reno, and Khristi Rulon.

Support

Primary funding for this fisher project is being provided by Sierra Pacific Industries. Sierra Pacific Industries and the California Department of Fish and Game will provide logistical support. Co-principal investigators for the project are Richard Callas (California Department of Fish and Game) and Steven Self (Sierra Pacific Industries).

Results

Trapping was conducted in the Sacramento Canyon study area between January 9, 2006 and February 6, 2006. Twenty-six trap/box combinations were used in this effort. Traps were checked daily and trapping was conducted continuously (except for a block of 3 days between January 27 and January 29) for a total of 25 days. Traps were moved to new locations as conditions warranted. Because of snow and associated access concerns, some traps were closed on occasion and a few were never set. Total trap nights (TN= 24 hour period between setting and checking trap) were 504 of a possible 650.

Trapping was conducted in the South Weaverville study area between February 21, 2006 and March 14, 2006. Twenty-six trap/box combinations were used in the effort. Traps were checked daily and trapping was conducted continuously for 21 days. Traps were

moved to new locations as conditions warranted. Again, because of snow and associated access concerns, traps at some locations were not set. One trap was lost to a bear on the first night. Total trap nights were 352 of a possible 546.

For the two study areas combined, a total of 192 animals were captured (Table 1). Ringtail was the most common animal captured (71 captures), followed by fisher (43 captures), gray fox (39 captures), and spotted skunk (35 captures)(Scientific names included in Table 1). Other species captured were striped skunk (1 capture), Douglas squirrel (2 captures) and bobcat (1 capture). Overall trap success (percent of TN capturing an animal) was 22.4 percent, ranging from 18.5 percent in the Sacramento Canyon study area to 28.1 percent in the South Weaverville study area.

Twenty-four individual fishers were captured a total of 43 times (24 initial captures and 19 re-captures). Three female fishers and 1 male fisher were captured in the Sacramento Canyon study area. Six female fishers and 14 male fishers were captured in the South Weaverville area. Hair and fecal samples were recovered from all captured fishers, blood samples were removed from 18 fishers, and premolars (1 per animal) were removed from 20 fishers. Both the blood and tooth samples are currently at laboratories undergoing analyses, while the hair samples have had DNA extracted and stored. The fecal samples remain in the possession of the CDFG.

All 9 female fisher captured were fitted with radio collars. Of those, 8 were considered to be adults and one was a sub-adult. None of the adult female fisher appeared pregnant based on palpation or teat development at the time of their capture. One of the females was an older animal, with a relatively low body weight and many teeth missing or substantially worn.

Capture rates (captures per TN) by species varied between the two study areas (Table 1). Spotted skunks were the most common animal caught in the Sacramento Canyon study area, while no spotted skunks were captured in the South Weaverville study area. Fishers were captured 1.4 percent of the trap nights in the Sacramento Canyon area and 10.2 percent of the trap nights in the South Weaverville area. Across all species, the animal capture rate was higher in the South Weaverville area than in the Sacramento Canyon area (28.1% versus 18.5%).

The pattern of trap nights available to fishers¹ varied over the trapping period between and within the two study areas (Figures 2 and 3). Over the trapping period in the Sacramento Canyon study area, the number of trap nights available to fisher declined, due primarily to increasing captures of non-target species, especially ringtail and spotted skunk. In the South Weaverville study area, where some traps were moved to new locations to avoid repeated captures of non-target species, a pattern of increasing and then decreasing availability was observed.

¹ Trap nights available to fishers are those trap nights where a fisher was caught or the trap remained un-triggered and the bait remained intact.

Latency to first detection² (LTFD) for fishers varied by study area, with the average LTFD in the Sacramento Canyon area equaling 8.2 trap nights while the LTFD for the South Weaverville area equaled 4.0. This difference was mirrored in the number of trap nights per trap location, averaging 15.7 and 8.6 at Sacramento Canyon and South Weaverville, respectively.

Ongoing Activities

Currently, we continue to obtain den, rest site and telemetry locations for nine radio-collared female fishers, with a focus on locating maternal dens. As of June 9, 2006, we have documented 2 natal dens (where parturition occurred) and 7 maternal dens (where the females moved their young)(Table 3). All the located dens were in cavities in standing live or dead trees, primarily in black oak (Quercus kelloggii) (n=6). Other tree species used for denning by the study animals were live oak (Q. chrysolepsis) (n=2) and Douglas-fir (Psuedostuga menziesii) (n=1). All but the Douglas-fir were live trees. Of the two natal dens, one was in a black oak and one in a live oak. Dens used by fisher during this study were primarily in cavities formed by decay, where limbs were broken at the trunk of trees, or in cavities apparently excavated by pileated woodpeckers (Dryocopus pileatus). The documentation of den and rest site locations will continue into the summer of 2007, covering the majority of two breeding seasons. Vegetation will be sampled at dens documented in 2006 and 2007. A second progress report will be completed in Fall or Winter of 2006 and a final report will be completed in late 2007. The final report will contain a synthesis of all the biological information collected in this study.

² Latency to first detection as used here is the number of days a trap location is trapped before the initial capture of a fisher. Only initial captures are used for this metric.

References

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Cover Photos

Cover photos taken by Pete Figura, California Department of Fish and Game.

Photos are 1) fisher maternal den tree 077M1; 2) den entrance; 3) 2 fisher kits.

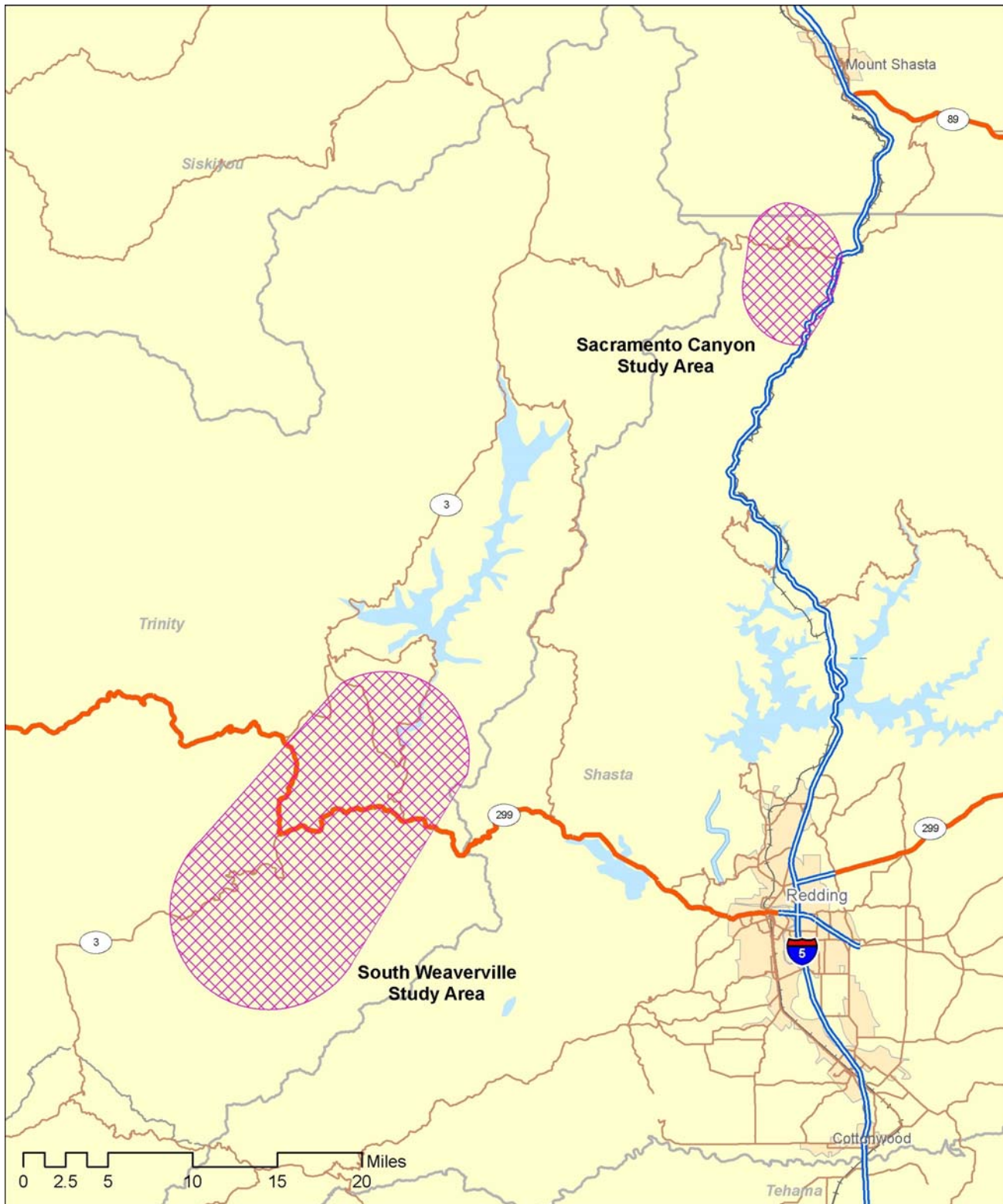
Table 1. Summary of Fisher Trapping Data for the Sacramento Canyon and South Weaverville study areas, January 9-June 9, 2006.

Common Name	Scientific Name	4 letter code	Sac, Canyon Captures	Sac. Canyon Captures/TN	S. Weaverville Captures	S. Weaverville Captures/TN	Total Captures	Overall Captures per Trap Night	Notes
Ringtail	Bassariscus astutus	BAAS	34	0.067	37	0.105	71	0.083	
Fisher	Martes pennanti	MAPE	7	0.014	36	0.102	43	0.050	24 individual fisher were captured, 9 females, 15 males, 1 juvenile, most 2-4 years, 1 old animal
Grey fox	Urocyon cinereoagenteus	URCI	14	0.028	25	0.071	39	0.046	
Spotted skunk	Spilogale gracilis	SPGR	35	0.069	0	0.000	35	0.041	
Striped skunk	Mephitis mephitis	MEME	1	0.002	0	0.000	1	0.001	
Douglas squirrel	Tamiasciurus douglasi	TADO	2	0.004	0	0.000	2	0.002	
Bobcat	Felis rufus	FERU	0	0.000	1	0.003	1	0.001	
Total Captures			93	0.185	99	0.281	192	0.224	
Total Trap Nights			504		352		856		
Trap Nights Available to fisher			374		268		642		T/N available to fisher are those where we either caught a fisher or the trap was not sprung and bait not taken
Fisher Captures as % of Available TN				0.019		0.134		0.067	

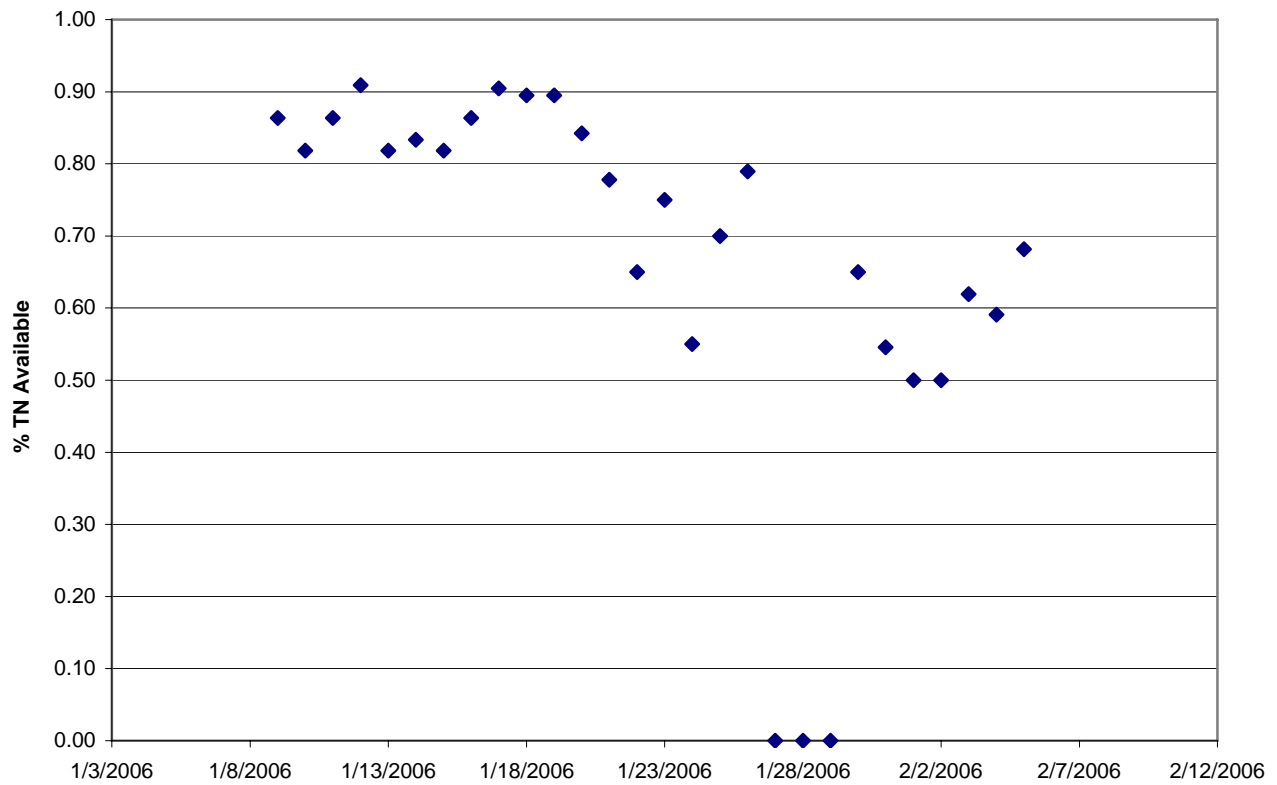
Table 2. Initial Documentation of Fisher Natal and Maternal Dens

Den ID	Den Type	Tree Species	Den Tree Condition	DBH (in)	Date of 1st Known Use	Comments
077N1	Natal	Black Oak	Live	18.7	4/4/2006	Cavity entrance located above forest canopy, approximately 40 feet up the bole, with use beginning prior to deciduous leaf-out, so no canopy cover existed over the den entrance during early use. Overstory removed from stand 10-15 years ago.
077M1	Maternal	Black Oak	Live	25.2	4/21/2006	Den entrance located approximately 9 feet above ground. Two kits heard in cavity and a picture revealed at least 2 kits in cavity. Overstory removed from stand 10-15 years ago.
077M2	Maternal	Black Oak	Live	20.3	5/18/2006	Several separate fisher scats found on ground within 10 feet of base of den tree. Area selectively logged 10-15 years ago. Overstory removed from stand 10-15 years ago.
077M3	Maternal	Douglas fir	Dead	65.5	6/2/2006	Large, tall snag with dead reformed top in streamside zone. Zone selectively logged 10-15 years ago.
423N1	Natal	Live Oak	Live	51.8	3/22/2006	At 7 feet, bole branched into 4 separate stems, ranging in diameter at base from 16-32". Stem believed to be used as Den was 24" diameter at base. Den tree located in steep, rocky live oak stand.
423M1	Maternal	Black Oak	Live	21.6	4/26/2006	Den tree located in timber stand logged in 2003 using a shelterwood removal Rx. Oaks 12" and larger and spaced approximately 75 feet apart were left along with sapling/pole conifer stand. Several separate fisher scats located near base of tree.
423M2	Maternal	Black Oak	Live	21.1	5/18/2006	Den tree located in same timber stand as 423M1, logged in 2003 using a shelterwood removal Rx. Oaks 12" and larger and spaced approximately 75 feet apart were left along with sapling/pole conifer stand.
423M3	Maternal	Black Oak	Live	28.9	5/31/2006	Den Tree located on main ridgeline between 2 watersheds. Overstory removed from stand 10-15 years ago.
423M4	Maternal	Live Oak	Live	45.8	6/2/2006	Den tree located in steep, rocky, live oak stand.

Figure 1. Map of Trapping Areas for SPI-CDFG Fisher Den Study



**Figure 2. Percent of Total Trap Nights That Were Available to Capture Fisher
In the Sacramento Canyon Area**



**Figure 3. Percent of Total Trap Nights That Were Available to Capture Fisher
In the South Weaverville Area**

