

REMOTE CAMERA SURVEYS AND NON-INVASIVE GENETIC SAMPLING OF FISHERS IN THE SOUTHERN CASCADE MOUNTAINS OF OREGON.

FINAL REPORT

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INTRODUCTION

Recent research has shown that (1) there are two extant populations of fishers (*Martes pennanti*) in Oregon that are restricted to the southwestern portion of the state: one in the southern Cascade Range and one in the northern Siskiyou Mountains (Aubry and Lewis 2003); (2) fishers in the southern Cascades are descended from fishers translocated to Oregon from British Columbia and Minnesota between 1977 and 1981 (Aubry and Lewis 2003; Drew et al. 2003); (3) fishers in the Siskiyou Mountains in Oregon represent the northern extent of indigenous fisher populations in northwestern California (Wisely et al. 2004); and (4) these two populations of fishers are isolated from each other by ecological and anthropogenic barriers in the intervening area, which includes oak savannas, agricultural and urban development, and the Interstate 5 corridor (Aubry et al. 2004). These findings have significant implications for the conservation of fisher populations in the Pacific states. Recently, photographic detections of fishers were obtained near Howard Prairie, and Hyatt Lakes in the southern Oregon Cascades (Jeff Stephens, 2009). These detections were located in the gap area between the Siskiyou and Cascade Mountain Ranges (Aubry et al., 2006). Therefore, it is unclear which population these individuals are related to. These detections of fishers which are about 18 km east of previous detections in the northern Siskiyou Mountains, and 16 km south of previous detections in the southern Oregon Cascades, demonstrates that we lack a clear understanding of the distributional limits of fisher population in this region. We have good sample sizes of DNA from both introduced fishers in the Cascade Range in Oregon and indigenous fishers in northwestern California from which we could assign these individuals if DNA samples could be obtained.

STUDY AREA

The study area is referred to as “the Dead Indian Memorial Plateau” and is located south of Mt. McLoughlin and north of Howard Prairie Lake within the Cascade Mountain Range of the Cascade Mountain Physiographic Province in southern Oregon. Elevations within the study area ranged from 1,400-2,228 m. The area is characterized by relatively smooth topography with rock outcrops which are relatively common in lava plateau terrain.

The majority of precipitation for this area falls between November and March. Precipitation near Howard Prairie Dam, Oregon at 1,392 m elevation is approximately 83 cm annually (USDA Forest Service and USDI Bureau of Land Management, 1997). Precipitation falls as snow throughout the winter months with pack depths reaching 1-2 m.

The study area has been heavily managed and consists primarily of young and mid-seral timbered stands with few remnant large trees and residual mature stands within the riparian corridors. Several plant association groups are present within the study area. At lowest elevations, the dry white fir (*Abies concolor*), association occurs. As elevation increases, associations change to moist white fir, cool white fir, and moist mountain hemlock (*Tsuga mertensiana*).

METHODS

Survey design

We conducted our survey using the standardized survey protocols for forest carnivores as developed by Zielinski and Kucera (1995). Their design involves the deployment of 2 remote cameras per 4 mi.² sample unit, operating for 28 nights per camera. Camera stations were located in each sample unit based on several factors, including previous surveys, topography, access, and distance separating it from adjacent camera stations. Stations were checked a minimum of once weekly.

Camera systems

We used two types of remote camera systems, CuddebackTM digital systems and TrailmasterTM 550 35-mm camera systems. Camera systems were set to record 24 hours/day. Systems were set approximately 3-5 m from hair snaring devices.

Hair traps

Hair traps consisted of corro-plast material, which is similar to corrugated cardboard, but is made of plastic. The corro-plast is cut into a rectangle approx. 81 cm long x 105 cm wide. The material is then cut through 1 side of the corro-plast using a box cutter and then folded into an open ended box with a finished size of about 25 cm per side x 81 cm long. The box is strengthened by wrapping it in several places with duct tape. The back end of the box is sealed with ¼" mesh hardware cloth to prevent target animals from accessing the bait through the back of the trap and avoiding the hair snares. The hardware cloth is attached to the back of the box using either 8" cable ties or 20-gauge galvanized wire. The hair-snaring device used three, 1" x 2" boards cut to fit the entrance of the hair trap. Strips of non-poisonous mouse glue strips were cut to fit the underside of the bottom board (figure 1). The boards are placed in the entrance in a design which manipulates the target animal to enter the trap below the bottom board through a restricted area, forcing the target animal to rub its back along the glue strip and snare a hair sample.

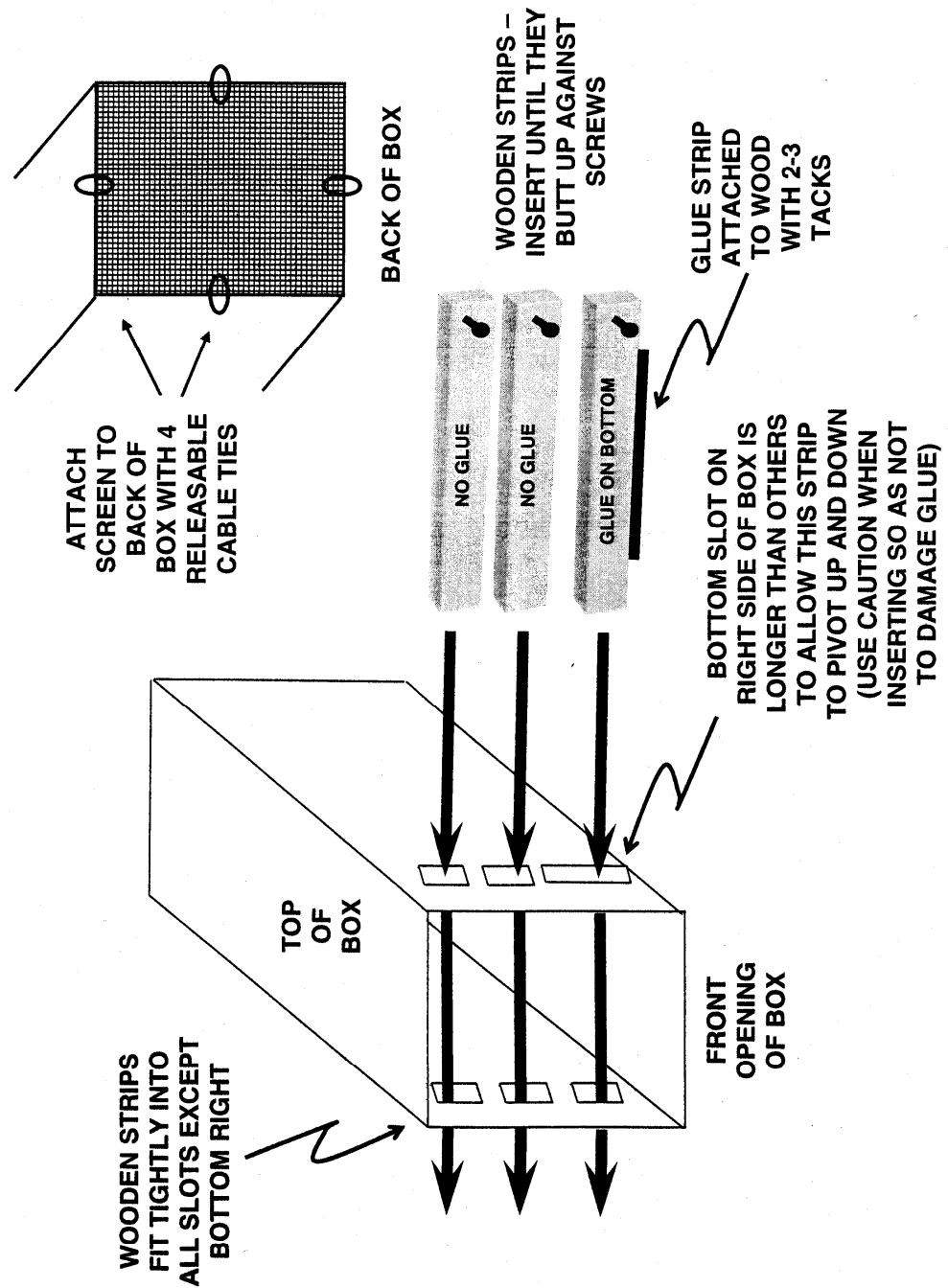
Hair traps were secured to the site to by driving a 1" x 2" board into the ground at each corner of the trap. Twenty gauge galvanized wire was tied between the stakes across the top of the trap to prevent movement of the traps and to prevent animals from moving the trap outside of the camera's view. All traps were covered with natural debris to provide a more natural cavity and to camouflage the site for security.

For all hair trap stations, chicken legs were placed at the back of the trap so the target animal was forced to completely enter the trap. We also included whole un-plucked chickens outside of the trap as an additional attractant. For a scent attractant, whole coho salmon (*Oncorhynchus kisutch*) carcasses were wrapped in ¼" hardware cloth and hung from a nearby tree with parachute cord. We also used a commercially available skunk-based lure.

Hair processing

To reduce the potential for contamination of hair samples, hair-snaring devices were placed in individual, quart-sized, plastic zip-lock bags in the field for transport back to the office. Each individual device was placed in its own bag, marked with the station number, sample number, date, and collector's name. We replaced the original adhesive backing on the glue-strip hair snares to prevent the glue strip from sticking to the container.

Figure 1: Corroplast box with glue snare

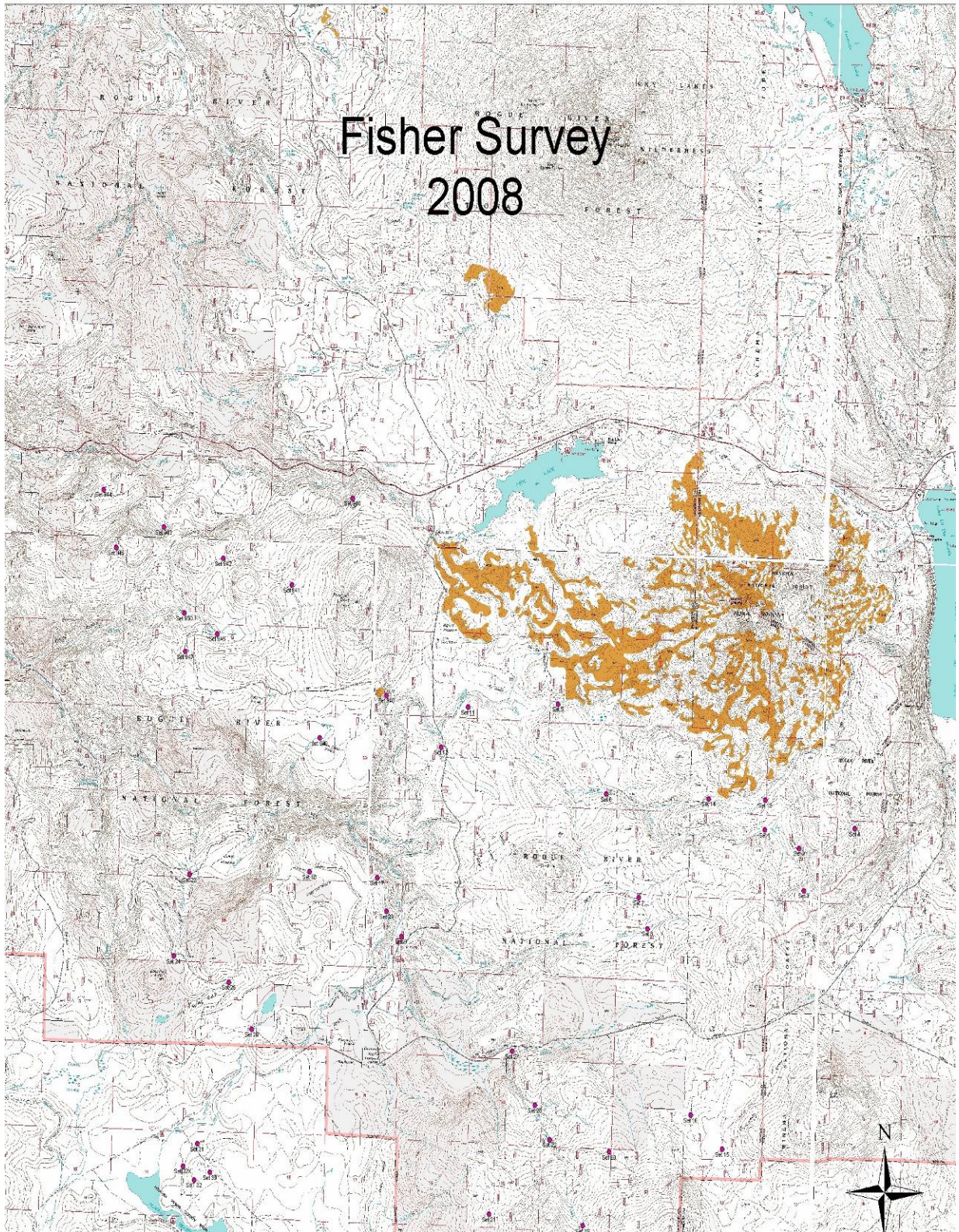


At the office, each hair-snaring device was placed on a clean sheet of paper and given an initial inspection. A new pair of latex gloves was used by the observer for analyses of each individual sample. For all types of hair snares except glue strips, any hair/DNA materials located were removed from the snare using forceps sterilized with ethanol. After initial inspection, each sample was viewed under a 2X - 4X dissecting microscope to locate additional hair samples. For glue strips, we cut all hairs sticking out of the strip (i.e., the part of the hair containing follicles) and placed them into a 50-ml vial containing about 20 ml of desiccant beads. We then replaced the adhesive backing onto the glue-strip and placed the strip into a second vial. Each sample was labeled with the station number, sample number, date, and number of vials associated with that sample.

RESULTS

We sampled nineteen 4 mi² sample units in late January thru mid June 2008 and November 2008 (figure 2). Fishers were not detected during the survey effort. We collected numerous hair samples, though none had the characteristics of fisher based on past experiences identifying fisher hair with positive results. Therefore, we did not forward any samples to the Rocky Mountain Research Station for DNA analyses. Other species documented through photographic evidence were black bear (*Ursus americanus*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), dog (*Canis* spp.), coyote (*Canis latrans*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), snowshoe hare (*Lepus americanus*), Douglas' squirrel (*Tamiasciurus douglasii*), flying squirrel (*Glaucomys sabrinus*), gray squirrel (*Sciurus griseus*), bushy-tailed woodrat (*Neotoma cinerea*), chipmunk (*Tamius* spp.), mouse (*Peromyscus* spp.), gray jay (*Perisoreus canadensis*), stellar jay (*Cyanocitta stelleri*), common raven (*Corvus corax*), and turkey vulture (*Cathartes aura*).

Figure 2: Study area and camera sites



DISCUSSION

The Dead Indian Memorial Plateau was identified as a critical information gap by the Fisher Science Team (Aubry et al., 2006). This area we surveyed lies equidistant between the introduced and indigenous fisher populations in southern Oregon. Several unconfirmed reports of fishers in this area have been provided to both the Bureau of Land Management (BLM) and Forest Service (FS). BLM biologists obtained photographic evidence of fishers near Howard Prairie and Hyatt Lakes in late March/early April, 2006 (Jeff Stephens, 2009). Additionally, scat dogs searched this area in November, 2008. One scat was identified to fisher by the Center for Conservation Biology at the University of Washington. The scat is scheduled to be sent to the Carnivore Conservation Lab at the Rocky Mountain Research Station in Missoula, Montana for mitochondrial analyses to identify which population the individual is related to. As of this writing, confirmation has not been obtained. Multiple baited camera sets were placed near these detections during this survey effort. Although we detected numerous carnivore species, we did not detect fisher.

National Forest System lands on the Dead Indian Memorial Plateau are designated as Late-Successional Reserve under the Northwest Forest Plan. Prior to 1994, this area was intensively managed for timber production and has few late-successional stands outside of major incised drainages. The Plateau is relatively flat and most stands are either young (<40 yr. old), or older stands (>100 yr. old) which have been thinned. The majority of these stands do not provide the very large, decadent trees and snags with vertical and horizontal structure which are generally associated with fisher dens (Aubry and Raley, 2006). Some of the drainages provide the type of stands that may provide fisher denning/resting habitat and dispersal corridors.

Although there are documented fisher detections and unconfirmed reports in the area, it is unknown whether there is a resident population on the Plateau. In early February of each year, adult males became more active and started to move longer distances, sometimes moving well beyond their non-breeding season home ranges presumably to locate reproductive females (Aubry and Raley, 2006). Because the majority of sighting and documented sites are recorded within the late winter/early spring period, it is possible that these individuals are adult males making long-distance movements looking for receptive females. However, this area is within 15-20 km of both indigenous and introduced populations. Therefore, it is conceivable that fishers are just beginning to pioneer and colonize the Plateau. The low detection rates of fishers on the Plateau suggest that the individuals detected are either males or that a low density fisher population occurs in the area.

It is clear that fishers use the Plateau, at least occasionally. The scat sample acquired by the BLM may provide information as to which population(s) the individual is related to. Because this area is the critical link between populations and the dispersal corridor for native fishers to re-colonize the Oregon Cascade Range, it is important that Agencies continue to monitor this area and additional samples are acquired to identify if genetic exchange is occurring between populations.

Acknowledgements

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Selected Photos From Camera Stations



Set 49



Set 50



Set 943



12/04/08 11:03 PM
Cuddleback



Set 940