



## *Redwoods to the Sea Forest Carnivore Tracking Project*

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### **Recommended Citation:**

Soucy, Margaret Noel. 2002. Redwoods to the Sea Forest Carnivore Tracking Project. A Report to Save-the-Redwoods League. Ancient Forests International: Redway, CA.

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**Redwoods to Sea Forest Carnivore Tracking Project  
Progress Report 1  
4 July 2001 – 11 November 2001**

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**USDA Forest Service Pacific Southwest Research Station,  
Redwood Sciences Laboratory**

**3 January 2002**

## Redwoods to Sea Forest Carnivore Tracking Project

### SUMMARY

The following is a progress report on the Redwoods to Sea Forest Carnivore Tracking Project. We are investigating mid-sized carnivore presence/absence in core reserves and areas of landscape continuity within the 'Redwoods to Sea Wildlife Corridor'. Core areas of our study area include Humboldt Redwoods State Park, Gilham Butte (BLM), and the King Range National Conservation Area (BLM). Our study area is within the recognized historical range of the Humboldt marten (*Martes americana humboldtensis*) and possibly includes suitable habitat for the marten and the Pacific fisher (*Martes pennanti*). Both mid-sized carnivores remain unverified in the area for over fifty years. Trapping records and museum specimens include historical evidence of Humboldt marten in the study area. Over the last ten years considerable concern has arisen over the status of the Humboldt marten subspecies, and the Pacific fisher is being petitioned for listing within its west coast range. Both species should be included in ecosystem management and biodiversity planning efforts in the coastal redwood zone. The objective of this study is to determine which mid-sized carnivore species are present within the reserve network of the Redwoods to the Sea Wildlife Corridor study area using the track box technique, and to make note of habitat conditions at each track box station. This information will be important in assisting conservation efforts in the redwood region. During the period from 4 July to 11 November 2001, a total of twenty nine track box stations were surveyed in five four-square-mile sample units. Mammal species detected included mice (*Peromyscus maniculatus* and other small mammalian species), ringtail cat (*Bassariscus astutus*), grey fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), spotted skunk (*Spilogale gracilis*), opossum (*Diadelphus virginianus*), chipmunk (*Tamias sp.*), and a striped skunk (*Mephitis mephitis*). Track box stations were set up in dense stands of Coastal Redwood forest with highly variable shrub cover from open to dense (0 - 95% shrub cover) and stands of Mixed Evergreen forests with relatively sparse to open shrub layers (0 - 40% shrub cover). Some sites were unlogged; at other sites large diameter conifers had been removed during the 1960's and possibly earlier; and other sites had been clearcut between 40 and 80 years ago. We plan to complete the remaining 2 sample units when the newly renovated park roads harden up after the rainy season in the spring of 2002.

This report also contains data from track boxes and motion triggered cameras conducted during 1999 through 2001 and collected by volunteers and community members in the 'Redwoods to Sea.'

### INTRODUCTION

The Redwoods to Sea Stewardship Project was born within the communities living in proximity to Humboldt Redwoods State Park, Gilham Butte, and the King Range National Conservation Area. Land owners and wildlands conservationists began to inquire into the possibilities of protecting and conserving a wildlife corridor from the 'Redwoods to the Sea' - that is the largest contiguous groves of ancient redwood forests, and the longest stretch of unroaded coastline on the west coast of the continental United States. Save-the-Redwoods League, Ancient Forest International and several community groups including the Middle Mattole Conservancy became active in fundraising, acquiring land, and creating awareness to preserve and restore the ecological integrity and functional landscape connectivity for wildlife inhabiting the vicinity of Gilham Butte.

## Redwoods to Sea Forest Carnivore Tracking Project

Humboldt marten were historically found in Humboldt Redwoods State Park and the Mattole (Grinnell et al 1937). Suitable habitat possibly exists for both marten and fisher in the Redwoods to Sea (Carroll 1997). The wildlife corridor concept was adopted partly with the intention to protect functional landscape connectivity for forest habitat specialists such as Pacific fisher, Humboldt marten, and Northern spotted owl, yet little to no inquiry has been made into the presence and habitat usage of these animals across the Redwoods to Sea landscape. A few unverified sightings by community members of both fisher and marten have been mentioned to the principle investigator, Noel Soucy. Sightings have been reported from Panther Gap, Wilder Ridge, and a local wildlife biologist, Campbell Thompsen, reported seeing a fisher near Briceland at the very southern end of Humboldt County.

Humboldt Redwoods State Park has not been systematically surveyed for mid-sized forest carnivores and most other wildlife species. Conducting wildlife surveys is not a concern for the Park. The Bureau of Land Management has had difficulty acquiring access to BLM lands within the vicinity of Gilham Butte, resulting in inadequate surveys for wildlife on lands under their management in the area. Some community members in Wilder Ridge, Honeydew, Salmon Creek, Panther Gap, Ceely Creek and Thompsen Creek have participated or conducted their own track box stations. Some of the results have been included in this report.

In his letter to support the need for information on the distribution of mammalian carnivores in the vicinity of Humboldt Redwoods State Park, Gilham Butte and the King Range, William Zielinski, Wildlife Ecologist for the USDA Forest Service, Redwood Science Laboratory writes: "Mammalian carnivores are important indicators of ecosystem condition and have proven to be critical tools for conservation planning. An important criteria for the maintenance and creation of connectivity among protected areas is how well they serve the needs of carnivores. The southwestern Humboldt region is particularly important in that it is within the historical range of two species associated with mature forests, the fisher and the marten. Unfortunately, populations of both species in the southern portion of Humboldt county are unknown and probably low. Both species are designated by the state of California as 'Species of Special Concern'. Martens within the range of the Humboldt subspecies were considered extinct just 5 ( in 1995) years ago when, surprisingly, a small population was discovered in Del Norte county. This subspecies is extremely vulnerable to loss, due to its size and isolation from other populations and blocks of suitable habitat. It is likely to be listed as threatened or endangered in the near future. The fisher, although relatively common in northwestern California, is less common in the redwood forest type, and has been petitioned 3 times to be listed as endangered under the Endangered Species Act; the most recent petition is pending (Center for Biodiversity 2000). So few fisher populations exist in western United States that the conservation of the species in the west hinges on protecting and growing the population in northwestern California. There is an urgent need for new information about the whereabouts of individuals or populations of fishers and martens, especially in relationship to reserved areas in southern Humboldt County.

"Martens and fishers are particularly vulnerable to extirpation because: (1) they are susceptible to trapping – incidental capture in traps set for other species and poaching, (2) their habitat is primarily old-growth conifer and mixed-conifer forest, and (3) as mammals, they have limited dispersal abilities (compared to birds), and are less likely to

## Redwoods to Sea Forest Carnivore Tracking Project

find and occupy suitable habitat that is not connected by suitable travel corridors. The advantage of conducting track box surveys for martens and fishers is that the same method used for these species will detect a number of other species of carnivorous mammals. Thus even without success at detecting martens and fishers, the distributions of other carnivores will be important information for the development of regional conservation plans. ... Too often decisions about the value of habitat are made on the basis of presumed habitat relationships and out-dated geographic range maps. The surveys proposed for southern Humboldt County will help fill a huge information gap in the distribution of martens, fishers and other mid-sized mammalian carnivores (April 2001).”

### Objectives:

1. Determine the presence of martens, fishers, and other mid-sized mammalian carnivores using track plate surveys.
2. Involve neighboring community members in checking track box stations.
3. Describe the habitat at track plate stations.
4. Assess habitat potential for martens and fishers by collecting data which is comparable to data collected in studies in other portions of their range in Northwestern California.
5. Assess landscape linkages for wildlife in the Redwoods to Sea Wildlife Corridor.

### Study Area

The study area encompasses the core reserves of Humboldt Redwoods State Park, Gilham Butte and the King Range National Conservation Area as well as the matrix of mostly private lands in between the core reserves. The study area includes several tributaries into the South Fork of Eel River, including Bull Creek, as well as the majority of the middle and upper Mattole River watershed. It is approximately 175 square miles and is entirely in southwestern Humboldt County, California. Public managing agencies include the State of California Department of Parks and Recreation and the United States Department of the Interior Bureau of Land Management. Save-the-Redwoods League holds title to several parcels in the vicinity of Gilham Butte. Elevation in the study area ranges from 200 feet to 3379 feet at the top of Grasshopper Peak, and over 4000 feet on top of King Peak.

The climate is coastally influenced; characterized by moderate temperatures, with rainy winters and warm, dry summers. Precipitation comes as rainfall during the winter (approximately 175 inches a year) and during the summer months mostly as fog drip. Snow occurs sporadically from year to year only on ridges and peaks, and rarely persists on the ground for long.

Following the habitat classification system in the Ecological Inventory Manual (Soucy et al. 2001), habitat types found within the study area include Coastal Prairie, Redwood and Coastal Coniferous forest, Mixed Evergreen forest, Oak Woodland, Riparian Woodland, and Riverine. Common conifer species include redwood (*Sequoia sempervirens*), Douglas fir (*Pseudotsuga menziesii*), and Pacific yew (*Taxus brevifolia*). Common hardwood species include tanoak (*Lithocarpus densiflora*), canyon live oak (*Quercus chrysolepis*), Pacific madrone (*Arbutus menziesii*), California bay laurel (*Umbellularia californiana*), Western hazelnut (*Corylus cornuta*), Oregon white oak (*Q. garryana*) and red alder (*Alnus rubra*). Common shrub species include evergreen

## Redwoods to Sea Forest Carnivore Tracking Project

huckleberry (*Vaccinium ovatum*), red huckleberry (*V. parvifolium*), salal (*Gaultheria shallon*), oceanspray (*Holodiscus discolor*), Oregon grape (*Berberis nervosa*), Pacific rhododendron (*Rhododendron macrophyllum*), whitethorn (*Ceanothus sp.*), California lilac (*Ceanothus sp.*), coyote brush (*Baccharis pilularis*), and manzanita (*Arctostaphylos sp.*). The study area is comprised of all seral stages of forest, including shrub, pole, early, mid, mature and multi-storied forest.

Road decommissioning and repair work has occurred on most of Humboldt Redwoods State Park roads during the last five years. Culverts have been replaced; roads outsloped; in-board ditches filled; some roads have been recontoured with stream crossings removed.

### METHODS

#### Trackplates

The survey design is consistent with the sooted trackplate method as described in American marten, fisher, lynx and wolverine: Methods for their Detection (Zielinski and Kucera 1995).

#### Cameras

Trail-master cameras with infrared light beam trigger were used during the spring of 2000 near Panther Gap in the upper portions of Bull Creek, and on Gilham Butte (BLM). The survey design was consistent with the trail-master camera technique as described in American marten, fisher, lynx and wolverine: Methods for their Detection (Zielinski and Kucera 1995).

#### Habitat Assessment

The methodology for the habitat assessment includes measurements that are consistent with the statewide systematic surveys discussed in Zielinski et al. (2000) and will allow for comparison between sites surveyed during this effort. Included in this procedure is the use of the California Wildlife Habitat Relationships (CWHR) classification for forest/shrub habitats, size class, and canopy closure at track plate stations. Modifications include tree size class estimation substituted for DBH measurement. These substitutions were made to shorten the amount of time spent conducting the habitat assessment.

### PRELIMINARY RESULTS

During the 2001 field season, five sample units were surveyed in Humboldt Redwoods State Park. (Additionally two sample units remain to be surveyed with the SRL grant award.) During the summer of 1999, two sample units were surveyed, one each in Humboldt Redwoods State Park and on Gilham Butte (BLM). During the spring of 2000, we also set up six Trailmaster camera stations, four in Humboldt Redwoods State Park, and two on Gilham Butte (BLM). We had many technical difficulties with camera stations.

#### Trackplates

Seven species of mammals and one unknown species of bird were detected at track plate stations (Table 1) in Humboldt Redwoods State Park. We detected gray foxes,

## Redwoods to Sea Forest Carnivore Tracking Project

ringtail cats, opossums, spotted skunks, a striped skunk, black bears, small mammals, a chipmunk, and a small bird. No carnivores were detected with track plate stations on or near Gilham Butte. No martens or fishers were detected anywhere in the study area.

During the summer of 1999, a spotted skunk and many small mammal tracks were recovered from Humboldt Redwoods State Park. Small mammal tracks were the only tracks recovered from track boxes on Gilham Butte during the same summer.

### Cameras

Two species of mammals and one species of bird were photographed during the spring of 2000 (Table 2). Photographs of striped skunk and gray fox were taken near Panther Gap in Humboldt Redwoods State Park. Photographs of a gray fox and a turkey vulture were taken on Gilham Butte.

### Habitat Assessment

Vegetation survey includes 2001 field data, only. All track box stations were set within Humboldt Redwoods State Park in Mixed Evergreen and Redwood Coastal Conifer (Soucy et al. 2001) forest stands with dense canopy closure. The dominant trees counted as 'in' trees in declining rank order were redwood, Douglas-fir, tan oak, California bay laurel, red alder, Pacific madrone, and Pacific yew. Tan oak comprised 27% of the total canopy closure recorded for all plots, where as redwood comprised 22% and Douglas-fir comprised 24%. Multi-storied canopies and large diameter downed logs were common at most stations, especially in unentered old-growth redwood stands. 57% of track box stations were within 20 meters of above ground water.

Shrub cover for both forest types varied from 0-95% closure. Most Redwood and Coastal Coniferous forest stands had open to dense shrub layers, whereas Mixed Evergreen forest stands usually had sparse to open shrub layers. Dominant shrubs in declining rank order were evergreen huckleberry, tan oak, salal, California hazel, wild rose, red huckleberry, oceanspray, Pacific rhododendron, poison oak, and Oregon grape.

## DISCUSSION

In the absence of large predators in the redwood region, mid-sized carnivores may be in higher abundance than they were historically. Unlike most large terrestrial predators, smaller predators (mesopredators) prey on birds. "In many parts of North America, extirpation of dominant predators has resulted in a phenomenon known as 'mesopredator release' in areas supporting small to mid-sized predators (foxes, skunks, raccoons, opossums, feral and domestic housecats...). Widespread elimination of top predators from terrestrial ecosystems the world over has disrupted the feedback process through which predators and prey mutually regulate each other's numbers. The role of predation has become a matter of intense interest to conservationists because mounting evidence points to the pivotal role of predation in helping to preserve the biodiversity of terrestrial communities. Predators prevent prey populations and mesopredators from exploding into hyperabundance while rarely, if ever, driving prey to extinction... The operation of such feedback mechanisms can be likened to 'a balance of nature.' Nature stays in balance so long as a fauna remains intact and the full suite of ecological processes operates unhindered. The absence of top predators appears to lead inexorably to ecosystem simplification accompanied by a rush of extinctions. (Terborgh et al 1999)"

## Redwoods to Sea Forest Carnivore Tracking Project

### FUTURE PLANS

Funds exist to continue track box visits in the Spring of 2002. Two additional sample units will be tracked after the new roads dry up. A grant award will be needed to conduct track box stations in selected unsurveyed sample units in the Redwoods to Sea Wildlife Corridor. Approximately fifteen additional sample units could be surveyed within the Redwoods to Sea Wildlife Corridor, including portions of Humboldt Redwoods State Park. If track boxes continue to fail at detecting marten or fisher, some sample units in highest predicted probability areas for detecting fisher and marten (Carroll 1997) should additionally be surveyed with Trailmaster Cameras.

Surveys should also be conducted for other mature forest specialists that are wide-ranging to help determine the function of the Redwoods to Sea Wildlife Corridor for movement and dispersal of wildlife. Surveys have not been conducted for northern spotted owls and other raptors in Humboldt Redwoods State Park, Gilham Butte, and the majority of the wildlife corridor outside of the King Range National Conservation Area and remaining corporate timberlands. Radio-collaring wide-ranging carnivores, ideally forest specialists, would provide valuable information on topics such as species movements, and territory sizes.

Research should continue in finding and copying historical trapping information from the old timers in the Mattole valley.

Efforts should focus on current gaps in protective measures of occupied or adjacent areas as well as to evaluate the relative degree of functional landscape connectivity between the species' populations and protected areas harboring potentially suitable habitat.

### ACKNOWLEDGEMENTS

Many individuals and groups have contributed to the Redwoods to Sea Forest Carnivore Tracking Project to make this effort possible. Thank You-- Save-The-Redwoods League and Ruskin Hartley for the grant award; USDA Forest Service Redwood Sciences Laboratory for tracking equipment; Bill Zielinski for scientific advice and project support; Rix Schelexer and Chet Ogan for fixing wet cameras, Middle Mattole Conservancy for negotiating land access, feeding hungry, cold, wet volunteers, and being there protecting it all, Ancient Forest International for project administration; Lynn Ryan and Dave Walsh for making sure trackers get paid for checking their boxes; Humboldt Redwoods State Park for the research permit and a summer of free camping.

Additionally, we want to thank all those who came and spent a day or two or more in the field helping check boxes and cameras in 1999- 2001 - Scott Tenney, Grace Brookman, Benjamin Marckmann, Jon Poschman, Joseph, Doug Smith; Panther Gap Community members: Rob Anderson, Gabrielle and Briana Roache, Micah, Gail Samuels; Salmon Creek community members: Will, Danielle, and Althea Randall, Jeff, Sara, Rob and Lisa Farmers: Roger, Kristine, Jeff Nyhen, Gretchen, Gabe, Kendall, Jesse Rainbow; Free Radicals: Brook Trout, Ash, Raven, Krishna, Demien Sparks, Lia, Nick, Keith Slauson, Joshua Isreal, Sherry Benally, any others I forgot??

I also want to personally thank all the kids that came out of the woods cold, wet, hungry and tired after getting chased by cops, bear poacher trackers and loggers, all to save the habitat for the wild ones on the other side of the hill from my study area. Save Rainbow Ridge!!!!



# Redwoods to Sea Forest Carnivore Tracking Project

## LITERATURE CITED

- Carroll, C. 1997. Masters Thesis: Predicting the distribution of fisher (*Martes pennanti*) in Northwestern California using survey data and GIS modeling. Oregon State University.
- Carroll, C., W.J. Zielinski, and Reed F. Noss. 1999. Using presence-absence data to build and test spatial habitat models for the fisher in the Klamath Region, U.S.A. *Conservation Biology*, 13(6), 1344-1359.
- Center for Biological Diversity, Sierra Nevada Protection Campaign. November 2000. Petition to list the Pacific fisher (*Martes pennanti*) as an endangered species in its West Coast Range. Petitioners: Center for Biological Diversity, Sierra Nevada Protection Campaign, American Lands, Environmental Protection Information Center, Klamath Forest Alliance, Klamath-Siskiyou Wildlands Center, Natural Resources Defense Council, Predator Conservation Alliance, Siskiyou Project and Siskiyou Action Project.
- Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. *Fur-bearing Mammals of California*. Vol.1. University of California Press, Berkeley, CA. 375 pp.
- Grinnell, J.H., J. Dixon. 1926. Two new races of the pine marten from the Pacific Coast of North America. *Zoology* 21(16):411-417.
- Mayer K., Laudenslayer W., eds. 1988. *A Guide to Wildlife Habitats of California*. California Department of Fish and Game, Sacramento, CA.
- Slauson, K.M., W.J. Zielinski, J.P. Hayes. 2001. Ecology of American Martens in Coastal Northwestern California. USDA Forest Service, Pacific Southwest Research Station, Redwood Sciences Laboratory, Arcata, CA. Department of Forest Science, Oregon State University, Corvallis, Oregon. Progress Report I 5 June 2000 – 1 December 2000.
- Soucy, M.N., B.S. Marckmann, K.M. Slauson, D. Boiano, S. Green. 2001. *Ecological Inventory Manual- An Introduction to the Wildlands and Focal Species of the California North Coastal Basin*. LEGACY-The Landscape Connection, Ancient Forest International.
- Terborgh J, Estes JA, Paquet P, Ralls K, Boyd-Heger D, Miller BJ, Noss RF. 1999. The role of top carnivores in regulating ecosystems. PP. 39-64 in Michael E. Soule and John Terborgh (eds.). *Continental conservation: Scientific foundations of regional reserve networks*. The Wildlands Project, Island Press, Washington, DC
- Zielinski, W., T. Kucera. 1995. American Marten, Fisher, Lynx and Wolverine: Survey methods for their detection. U.S.D.A. Forest Service, PSW-GTR-157.
- Zielinski, W., R.L. Truex, L.A. Campbell, C.R. Carroll, and V.F. Schlexer. 2000. Systematic surveys as a basis for the conservation of carnivores in California forests. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Redwood Sciences Laboratory, Arcata, CA. Progress Report II: 1996-1999.

Redwoods to Sea Forest Carnivore Tracking Project

TABLES and APPENDIXES

Table 1A.

Species detected at track box stations in 2001 in Humboldt Redwoods State Park

	Detected at number of stations	Percent of sample n=29
Gray fox	6	21%
Ringtail cat	6	21%
Opossum	4	14%
Spotted skunk	9	31%
Striped skunk	1	3%
Black bear	4	14%
Small mammal species	14	48%
Chipmunk sp.	2	7%
Unknown bird species	1	3%

Table 1B. Other Redwoods to Sea Carnivore Tracking Results 1999-2001

Species detected at track box stations in 1999 in HRSP

	Detected at number of stations	Percent of Sample n=6
Spotted skunk	1	17%
Small mammal species	5	83%
Chipmunk species	1	17%
Black bear	1	17%

Species detected at track box stations in 1999 on Gilham Butte

	Detected at number of stations	Percent of Sample n=6
Small mammal species	5	83%
Lizard (alligator lizard?)	1	17%

Species detected at camera stations in 2000

	Detected at number of stations in HRSP	Percent of sample n=4	Detected at number of stations on Gilham Butte	Percent of sample n=2
Gray fox	1	25%	1	50%
Stripped skunk	1	25%	0	---
Turkey vulture	0	---	1	50%

## Redwoods to Sea Forest Carnivore Tracking Project

### Community Conducted Track Box Stations

	1999 Dixon Butte n=2	1999 Wilder Ridge n=x	2001 Honeydew School 6-10 yr kids n=1
Grey fox		present	1
Spotted skunk		present	
Striped skunk			1
Small mammals	2	present	1
Wood rat		present	
Raccoon	2		
Birds			Stellar's jay?
Domestic dog			1
Domestic cat			1

Tracks and photos in the above tables are available upon request from the Principle Investigator.

Community members conducted track box stations yielding mid-sized carnivore tracks in Salmon Creek, Ceely Creek (S. fork Eel River) and Thompsen Creek (upper Mattole), however, copies of track results from these surveys are not recorded by the Principal Investigator. None to my knowledge yielded marten or fisher tracks.



Rockefeller Grove in Humboldt Redwoods State Park  
Where have all the martens gone?