SNAMP Fisher Field Trip May 1, 2012 9:00 to 4:00 pm
Oakhurst, CA

In attendance:

Susan Antenen, Conservation Biology Inst.
Adele Bartholomew, Local resident
Phil Bartholomew, Local resident
Marcie Baumbach, US Forest Service
Matt Bissell, Yosemite Mountain Ranch
Sandy Brinley, Local resident
Steve Brink, Calif. Forestry Association
Sue Britting, Sierra Forest Legacy
John Buckley, Central Sierra Environmental Research Center
Mike Chapel, USFS Region 5
Lindsay Cline, Yosemite National Park
Kelly Cruce, UC Berkeley
Lorna Dobrovolny, CA Dept. Fish & Game
Bill Dodge, Calvin Crest outdoor ed. school
Kent Duysen, Sierra Forest Products
Larry Duysen, Sierra Forest Products
Bill Fjellbo, Tehipite Sierra Club
Pamela Flick, Defenders of Wildlife
Jim Fouch, USFS Sierra National Forest
Marcia Freedman, Local resident
Kaiden Grossi, Local student
Jeannie Habben, San Joaquin Watershed Council
Stacy Heminway, CA Dept. Fish & Game
Peter Hopkinson, UC Berkeley
Mike Horvath, City of San Francisco - Hetch Hetchy
Jerry Jensen, Society of American Foresters
Susie Kocher, UC Cooperative Extension
Anne Lombardo, UC Cooperative Extension
Dave Martin, USFS Sierra National Forest
Kirby Molen, Sierra Forest Products
Katherine Napier, USFS
Canh Nguyen, CA Dept. Fish & Game
Susan Norman, Local resident
Peter Norquist, Livermore Laboratory
Carrie O'Brien, UC Berkeley
Anae Otto, USFS Sierra National Forest
Adam Rich, USFS Sierra National Forest
Brian Rueger, Tule River Tribe
Michelle Schroeder, Sierra Pacific Ind.
Greg Schroer, USFS
Wayne Spencer, Conservation Biology Inst.
Josh Spiegel, UC Berkeley
Rick Sweitzer, UC Berkeley
Dana Walsh, USFS El Dorado National Forest
Angela White, USFS Pacific Southwest Res.
Angela Woodside, UC Berkeley

Introduction - Batterson Work Station

We started the day with a brief introduction to the Sierra Nevada Adaptive Management Project (SNAMP) and participants and an overview of the day's plans.

Fisher denning: Dr. Rick Sweitzer discussed how the SNAMP Fisher Team locates and verifies trees used by female fisher for denning. In the early denning season, the team locates dens by identifying females (from aerial reconnaissance) in a similar place over several days. Once possible den tree is

located, 3 to 4 motion detecting automatic cameras are focused on it in order to obtain photographic confirmation (up/down movements) that it is an actual den tree. These den cameras can help count the kits if photos are obtained when female move kits out of the den. Den tree climbs are done only when exterior cameras are unable to photograph the kits. Researchers climb the tree in the mother's absence and a drop a camera down into the den. The team has identified 98 den trees so far.

One goal of the project is to learn to identify good fisher denning habitat once SNAMP has finished so that the high quality habitat can be protected. The Fisher Team is searching for methods that allow estimation of denning habitat without having to know exact fisher locations by maintaining an expensive tracking program. There seems to be a temporary evacuation of habitat by fisher after treatment but it is too early to say yet whether this is a long lasting effect. Some move back in. Treatments that occur in winter may not trigger moves out until the next year. Additional post project data (like that gathered for the Cedar Valley project) will be needed to make valid conclusions.

Home ranges: There are believed to be between seven and eleven fisher using the key watersheds within the SNAMP study area. Female fisher home ranges are estimated to be about 19 to 25 square kilometers – males' are two to three times larger at 60 to 90 square kilometers. In summer, some fishers tend to use higher elevation areas but they return to their lower ranges with winter snows. Drainages provide a good micro climate for them in the summers. There is still no evidence of fisher north of the Merced River.

STOP 1 - 6s47Y

The group drove up Sky Ranch Road and turned onto 6s47Y, traveling through some masticated areas treated about 2 years ago by the Forest Service as part of the Cedar Valley Project. There currently are no fishers occupying the treated area. At an area that had recently been treated as part of the Sugar Pine project, Rick discussed two fisher (M02, F01), both of which were caught nearby.

Fisher life stories: Female 01 (F01) did not reuse a den tree that the fisher team knows of, although they have found that about 60% of fisher do reuse den trees. F06, F18 and F25 all reused two den trees two years in a row. Some have reused other female's trees. F01 has recently died as the result of an infection from a predator attack.

Male 02 was captured in December of 2007. He was lost May 2008 and found again in August '08 about 20 miles away near Badger Pass on the way into Yosemite. His signal was lost in Jan 2012 and he was just found dead on Highway 41 near Bishop Creek about two weeks ago. Road kill is a significant threat to fisher. The team has found three or four non-collared fisher killed by cars in the area.

Question: Did M02 mate?
Answer: We are not sure. M02 only came back into the Rainer Creek watershed area two seasons ago.

Questions: Do you see ringtail cats during camera surveys?
Answer: Yes, they rank about fourth in frequency amongst the other species picked up by the cameras, so they are not uncommon. Bear top the list, then fisher, grey fox and ringtails. Bobcats, coyotes and mountain lions are seen less often.

Predation: The Fisher Team's data shows that bobcats are fisher's primary predator. The Fisher Team has photos of bobcat at den sites and evidence of them killing a kit and their mother. Survival was expected to be the lowest in the winter and highest in summer but the team has found the opposite to be true. March, April, May and June seem to have the highest mortality, partly related to high predation on denning females.

Question: Does the open habitat of thinned areas promote contact with predators?
Answer: This very good question and we are actively investigating it. Vegetative analysis of the concealment cover of predation sites is on the team's to do list. This is currently being done with den sites. Bobcats have killed two fishers in the last month. The carcasses were found but not their den trees so no kits were rescued. UC Davis has been successful at collaring one male bobcat in the area. UC Davis researchers have two bobcats radio-collared in the Kings River Fisher Project study area. .

***Question*:** Do bobcat eat the fisher carcasses?
Answer: Yes, whereas mountain lion and coyotes do not necessarily.

Question: How has the Cedar Valley treatment affected occupancy?
Answer: There were four or five fisher using the area before the treatment and there are none at this point. The evacuation may be temporary, but SNAMP is running out of time to really assess post treatment effects at this point.

Question: Has there been a macro look at how the density of roads might affect fisher denning?
Answer: The Fisher Team has recently produced a poster regarding animal detection and roads. See link:
http://snamp.cnr.berkeley.edu/static/documents/2012/03/03/Wildlife_Vehicle_Collisions_2012_Western_TWS.pdf

Question: Could human disturbance be attracting bobcats?
Answer: We don't think so. All cameras are de-scented and kept in plastic bags before being used around a den tree. They are only checked every three or four days with efforts not to disturb the female.

STOP 2 - Past the Sierra Beauty Giant Sequoia on 6s90

Home Range Analysis: There are seasonal changes in fisher home range that depend on sex. During denning season, females' home ranges are about a quarter of their normal size since female can only forage so far from their kits. Denning home ranges tend to be near the center of their overall home range, so knowing a female's normal home range may help predict where she will den. There is some shift in home from year to year. The number of detections of an individual animal at a camera can also help predict the location of the range core.

STOP 3 - 5s18 Road

Fisher Habitat: This area can be considered ideal fisher habitat since over 18 den trees have been identified. Fishers tend to stay in cooler drainages in the summer. Denning fisher like high canopy cover (70%) and the largest trees, in part due to their decay and cavities. The loss of hazard trees within 300 meters of roads is an issue as they are often old decadent trees with good denning cavities. Fishers do not excavate their den cavities, but use holes created by fungal tree damage, woodpeckers, fire scars or lightning.

Question: Why do fishers move their kits to different trees?
Answer: The kits are born very small, without fur and with their eyes closed. They grow quickly to about four times their birth size when they are weaned; they weigh around 200 grams at birth and two kilograms in mid-June. So kit growth and the need for more room is probably a factor. The female also defecates outside the den so getting some distance from the scent of feces is probably another reason.

Air support: The fisher plane flew overhead at this stop looking for signals from a collared fisher. The team currently has 40 fisher collared and it takes about three hours to locate them all by plane. The team greatly appreciates aviation support from the US Forest Service for the past five years. This frees the SNAMP crew from having to spend time doing extensive ground telemetry and allows them to collect additional data. Using test collars, the crew's accuracy in locating collared fisher from the air is about 300 meters.

Habitat modeling: Rick and Wayne Spencer from the Conservation Biology Institute discussed the draft habitat model they are working on. They are looking for correlations between summer survey data, track plate information, vegetation, aspect, slope and elevation layers. Many dens have been found in less than ideally predicted fisher habitat. This implies that more accuracy is needed in the California Wildlife Habitat Relationships vegetation layers to improve the model's accuracy and to help correct site specific differences. The ability to differentiate between class 4 and 5 would help, there is little class 6. Also, the resolution is too coarse and so drainages where fisher congregate cannot be segregated out. Micro climate data and associated temperature differences are also important. Rick hopes that the finer resolution of Lidar could help improve the models. Information on time since the last forest disturbance would also be helpful although variations in the treatments across the region makes this complicated.

LUNCH at Sugar Pine Railroad

Fisher prey: Porcupines are an important source of food for fisher in other areas but none have been seen in the Fisher Team's camera surveys in the SNAMP study area. Scat analysis in Arcata indicates that fishers there eat rodents, squirrels, lizards, berries and birds. Their diet here seems a little more diverse including plant material, but not porcupines. Without the porcupine as a source of food there is more energy required to obtain smaller prey. Squirrels take more energy to catch and produce less. A

fisher could live off one porcupine for five to 17 days, but would need two or three squirrel a day to provide similar energy. There is some evidence that rabbits and ground squirrel may be moving up slope, which may help.

The USFS Pacific Southwest Research Station (PSW) is doing a small mammal survey in the Sugar Pine area in conjunction with SNAMP. They are collecting data both pre and post fuel treatments. They have done them for two years and will return next year when the treatments are done. Angela White of PSW said that their recent survey numbers were quite low for all types of rodents.

Question: Are the fisher lingering near meadows where prey animals may congregate?
***Answer*:** Yes, they seem to be very close to meadows in the summer where there is more and larger prey to eat.

STOP 4 - Short hike to F25 Den Tree

Vegetation data: The group took a short hike to a den tree used by F25 in 2009. This was a broken off dead black oak about 20 feet tall on the edge of a recently thinned area. The Fisher Team demonstrated how they collect vegetation information along four transects each 18 meters long around a den tree. This protocol is also used by the SNAMP Forest Team for forest inventories. Concealment cover is measured at 10 meters in each direction. The loss of surface and ladder fuels around a den site may be significant. The most important places to maintain cover is in the steeper, ravines and canyons. Aspect does not seem to have an effect on denning locations.

The Fisher Team also measures the den entrance, depth and width. Some of the holes are quite small which is one reason Rick does not think that use of GPS collars, which are twice the size of radio-telemetry collars, is worth the risk. Female fishers need to squeeze in and out of such tight spots during denning season that they might not be able to get back out.

Oak conservation: Blue dot on oaks nearby indicated that nothing could be removed for 35 feet from the tree, according to Jim Fouch, USFS marking crew foreman. Smaller oaks have been cleared around so that they don't decline when overtopped by nearby conifers. Conifer groups of three or more trees of 30 inches in diameter or larger with closed crowns are also preserved with no holes in the canopy allowed. Only trees beneath 20 inches in diameter there are marked to be cut. As this land was clear cut 80 years ago it is a challenge to increase its heterogeneity. The goal is 60 percent canopy cover.

Question: Is there any danger to fisher from trash, referring to a plastic bag seen up in a tree?
Answer: Not that we know of. The Fisher Team has collected fecal samples during captures and at den sites and has found no evidence that animals are eating plastic.

STOP 5 - Jackson Road Short Hike to F18 Den Tree

The group took a short walk to look at an active maternal den tree from afar. The tree is a black oak reused from a previous season. Participants took turns holding the telemetry instrument to hear the radio collar signal from the fisher in the tree.

Wrap up/evaluations

Participants were asked for feedback and the field trip was concluded. Participants were asked what the most interesting or useful thing they learned at the field trip was. They said:

Denning

- Relative small size of some den trees (4)
- Walking through fisher denning habitat (4)
- Seeing den trees (3)
- Den tree types
- How dense den trees are in best habitat
- Proxy metrics for fisher dens (in contrast to intensive collaring/trapping)

Treatment

- Post-treatment character of stands

Habitat

- Differences in fisher habitat between Sugar Pine and Kings River, modeling parameters
- Home range analysis (2)
- Fishers and people who study them cover a lot of land
- That you can use cameras to estimate home range center

Fisher biology

- General fisher biology (2)
- Fisher survival rates in winter
- Fisher relationships between oaks and porcupines

Other:

- Everything / too much to list (2)
- How a good program can make a large impact
- Specific research findings