Short-term impacts of fuel management activities on fishers in the Sequoia National Forest - Ponderosa Urban Interface Fisher Project

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Summary

The risk of catastrophic wildfire is now the most pressing concern of western public land managers, and there is near universal agreement among researchers that the return of fire as an ecological process is a critical step in restoring ecosystem integrity. At the same time, public land managers are mandated to manage habitat such that viable populations of native vertebrates are maintained. Of particular concern are species such as the Pacific fisher (*Martes pennanti*) which rely on many of the same structural characteristics that make a forest prone to a catastrophic fire. It is typically assumed that fuel reduction will have an immediate negative impact on species such as the fisher, but that any direct negative consequences are outweighed by the indirect benefits associated with reducing the risk of large fires that eradicate habitat. However, while several ongoing research projects are currently addressing the long-term, population-level effects of fuel management on fishers, there is no information available on the animals' short-term response or the severity of the direct consequences mentioned above. Furthermore, there is no information available on how the impacts of different fuel treatment options may vary.

Previously, fine-scale data on fisher movement patterns was nearly impossible to collect due to fishers' rarity, small body size, large spatial requirements, secretive nature, and the ruggedness of the terrain they inhabit. However as part of the Kings River Fisher Project (KRFP), scientists from the USFS Pacific Southwest Research Station have worked with telemetry engineers to develop a fisher-sized GPS collar weighing less than 70 grams and capable of recording 1500 GPS locations. A smaller model, developed for females, weighs 38 grams and can record approximately 900 locations. The collars are designed not to impede a fisher's natural agility, the data can be remotely downloaded from the base of a rest tree or from the air, and prototypes are currently being field tested on the KRFP.

In order to capitalize on this new technology and provide data on the short-term, behavioral response of fishers to fuel reduction efforts, we propose to deploy a limited number of GPS collars on fishers in the vicinity of the Ponderosa Urban Interface Project on the Sequoia National Forest. Collars will be replaced approximately every 6 months between September 2009 and May 2011, and data on fisher use of the Ponderosa area pre, during, and post-fuel treatment will be collected. Changes in fisher movement patterns and habitat selection, at both individual and local population scales, will be used to evaluate the immediate impact of treatments.

Currently collars are being deployed on the Sierra National Forest in the vicinity of the Blue Canyon prescribed burn program. Additional sites on land owned and managed by Southern California Edison are planned for October 2009. Data from these sites will be combined with data from the Ponderosa project to better evaluate the overall impact of fuel treatments on fishers, as well as to compare the impacts of mechanical fuel reduction with prescribed fire. Additional funding and research opportunities are currently being pursued to expand this work throughout the southern Sierra Nevadas.

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Ponderosa Urban Interface Fisher Project – Project Outline

❖ Objectives
➢ To document fine-scale movement patterns of fisher before, during, and immediately after fuel treatment activities.

➢ To provide recommendations on how to minimize any short term negative impacts of fuel treatments on fishers.

➢ To document fine-scale fisher movement patterns and habitat use with respect to forest type and condition, topography, development, etc.

❖ Methods

➢ Trapping
1) Effort – estimate 3-4 weeks trapping effort per trapping period using one experienced KRFP trapper and 1-2 local assistants.

2) Equipment – Traps and trapping equipment are available either through the KRFP or other fisher/mesocarnivore research programs. At least 2 vehicles will be required during trapping periods.

3) Handling – fishers will be captured, anesthetized, and handled according to approved KRFP protocols. Blood samples will be taken for disease screening, animals will be PIT tagged for subsequent identification, and collars will be attached using breakaway devices designed and used on the KRFP.

➢ Monitoring and data downloading
1) Aerial – at least one day per month using USFS SNAMP plane. Primary responsibility for manning the flight will belong to the local Sequoia National Forest staff. If local staff are unavailable, KRFP staff will fill in.

2) Ground – as available by local personnel, but locating animals and downloading data every 2 weeks (between flights) would be optimal. Ground efforts will help maintain contact with the animal, reduce flight time, and provide more timely information on any mortalities.

➢ Data Analysis and Report Preparation
1) Data will be stored on the PSW server but made freely available. Copies of all raw data and final databases will be made available to the Sequoia National Forest within 2 weeks of collection and/or completion.

2) Primary data analysis will be the responsibility of PSW staff. As described above, data will be made freely available for local analysis as well.

3) Progress reports, including data on animals captured and monitoring success, will be provided to the Sequoia National Forest within one month of the completion of each trapping effort. Annual reports will be provided by 31 January 2009 and 2010. A final report will be provided by 31 July 2011.

Ponderosa Urban Interface Fisher Project: 22-month workplan

| Research Phase	Purpose	Partner Responsibilities
Remote camera surveys - Aug 2009	Identify number and relative size / sex of resident fishers	*PSW* – provide equipment, building trap cubbies, modifying existing fisher handling permits *SQNF* – install and monitor cameras
Trapping session 1 – 15 Sept – 31 Oct, 2009	Capture resident fishers: deploy GPS collars & collect biological samples	*PSW* – Provide experienced trapper. Set and check traps daily, oversee captures *SQNF* – Provide on-call help with captures
Pre-treatment monitoring period 15 Oct 2009 – 1 May, 2010	Monitor fisher movement: monthly aerial downloads plus bi-weekly ground locations	*PSW* – Backup monitoring as needed *SQNF* – Primary monitoring: supply biologist to fly monthly, periodic ground checks and/or downloads, respond to mortality signals
Ponderosa fuels treatment : 1 May – 30 Sept, 2010	Treat fuels surrounding Ponderosa. If treatments don't occur, no further trapping will be conducted and collars will be allowed to expire and drop	*PSW* – Backup monitoring as needed *SQNF* – Primary monitoring: supply biologist to fly monthly, periodic ground checks and/or downloads, respond to mortality signals
Trapping session 2 : 1 Feb – 15 March, 2010	Capture resident fishers, replace GPS collars & collect biological samples	*PSW* – Provide experienced trapper. Set traps and check daily, oversee captures *SQNF* – Provide on-call help with captures
Treatment monitoring period : 1May – 30 Sept, 2010	Monitor fisher movement: monthly aerial downloads plus bi-weekly ground locations	*PSW* – Backup monitoring as needed *SQNF* – Primary monitoring: supply biologist to fly monthly, periodic ground checks and/or downloads, respond to mortality signals
Trapping session 3 : 1Oct – 15 Nov, 2010	Capture resident fishers: replace GPS collars and collect biological samples	*PSW* – Provide experienced trapper. Set traps and check daily, oversee captures *SQNF* – Provide on-call help with captures
Post-treatment monitoring period : 1 Oct 2010 – 1 May, 2011	Monitor fisher movement: monthly aerial downloads plus bi-weekly ground locations	*PSW* – Backup monitoring as needed *SQNF* – Primary monitoring: supply biologist to fly monthly, periodic ground checks and/or downloads, respond to mortality signals
Data analysis : 1 May – 31 July 2011	Conduct movement and habitat use analysis, prepare final report.	*PSW* – data analysis and report preparation
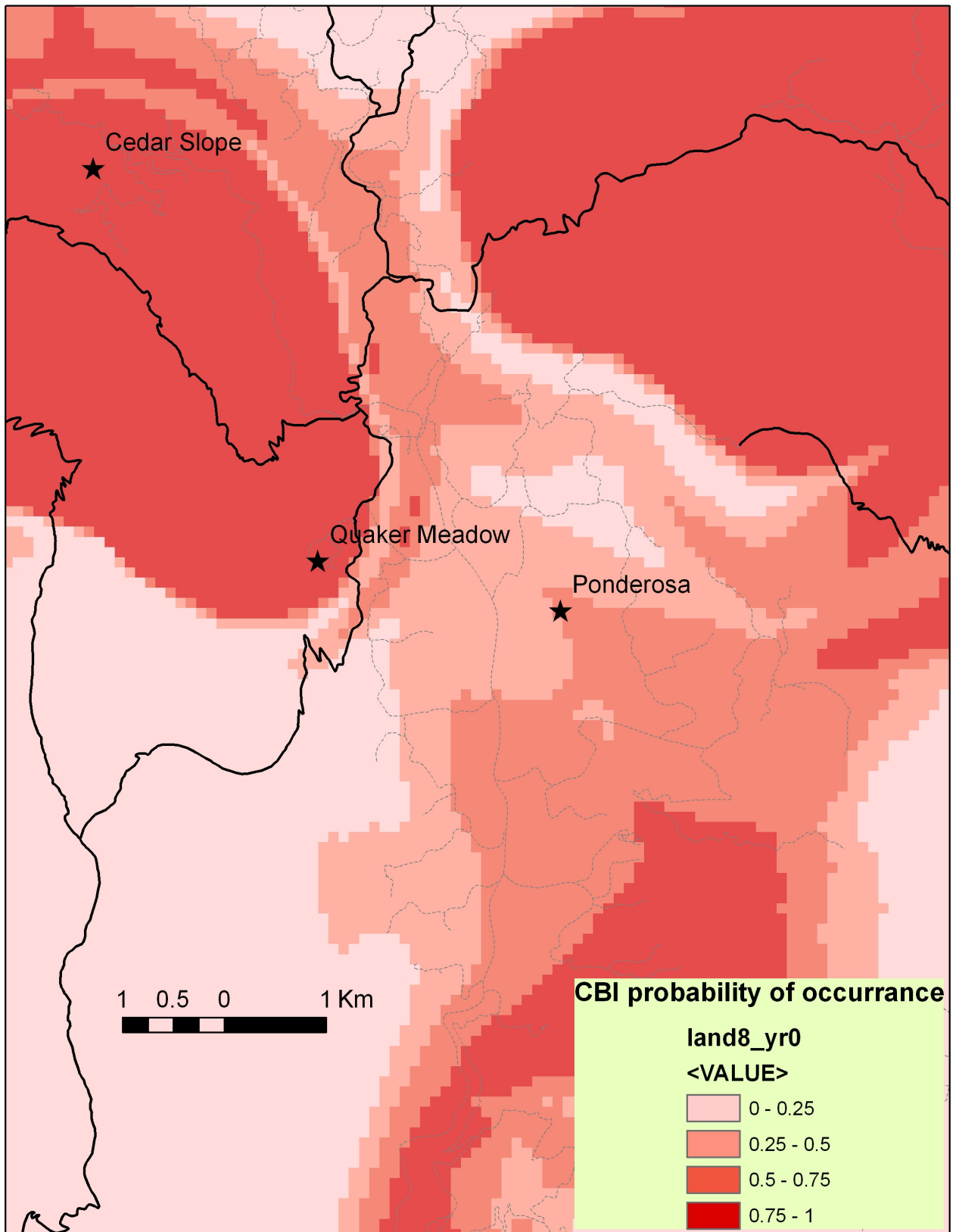
Figure 1. Results of the Conservation Biology Institute fisher probability of occurrence modeling for the Ponderosa area. Darker colors indicate higher likelihood of fisher presence.