

2020 Northern California Private Timberlands Fisher Conservation Summary Report

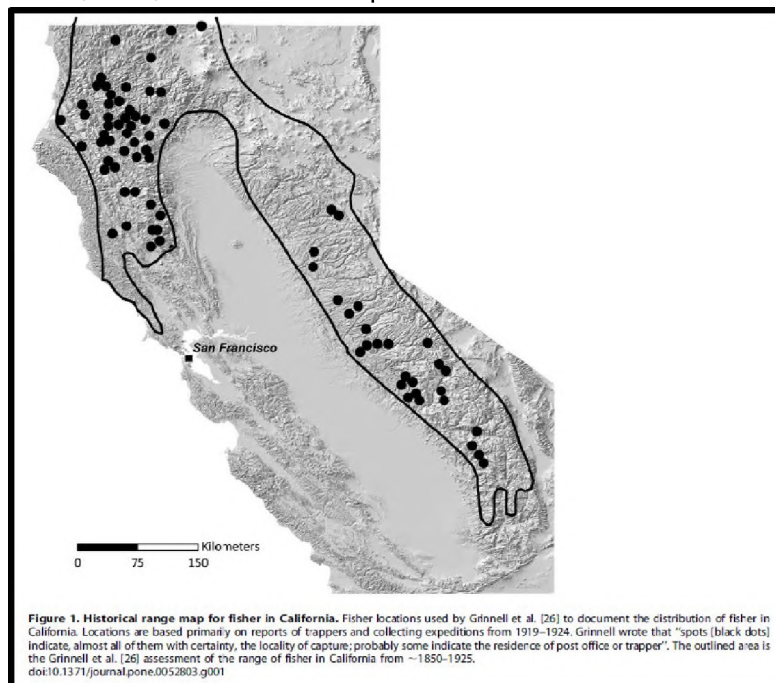
This report provides information on several subjects relative to the status of fishers in northern California and regarding conservation efforts on non-federal lands. This report was developed to help inform the proposed listing of fisher in northern California, and constitutes the best available scientific information.

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Fisher Range and Distribution in California

Historical Range

Information regarding historical fisher distribution in California is primarily derived from Grinnell et al. (1937) who described fishers as inhabiting forested mountains mainly from 2,000 to 5,000 ft elevation in the northern portions of their range, and 4,000 to 8,000 ft elevation in the southern portion of their range. Grinnell et al. (1937) further described fisher distribution at the time throughout much of northwestern California, and south along the west slope of the Sierra Nevada to near Mineral King in Tulare County. They also believed that the range of fishers as of that time (i.e., 1937) was reduced compared to the area encompassed by their "assumed general range" between approximately 1862-1937, which was derived from trapping records, museum specimens, and detailed review of anecdotal observations. The assumed general range included the area from "the Oregon border south to Lake and Marin counties and eastward to Mount Shasta and south throughout the main Sierra Nevada mountains to Greenhorn Mountain in north central Kern County" (Grinnell et al. 1937:214–215). CDFW (2015) described discussion by Grinnell et al. (1937) of several earlier records from the central Sierra, but by the time of the Grinnell et al. (1937) publication, California fisher distribution had been reduced relative to its former range, particularly in the southern Cascades and northern Sierra Nevada (See Map 1). Zielinski et al. (2005) suggested fisher populations in these areas may have been substantially reduced due to trapping and habitat loss by the time Grinnell et al. (1937) assessed the species' distribution.



Map 1 - Historic range map for fishers in California (Grinnell et al. 1937)

Current Range

Our understanding of contemporary fisher distribution in California is based on numerous systematic surveys and scientific studies (live trapping, radio collars, but are primarily baited camera stations and hair collection devices), along with incidental observations by experienced personnel. Fishers currently occupy portions of the Coast Range, Klamath Mountains, southern Cascade Range, northern Sierra Nevada, and the southern Sierra Nevada. Fishers in California occur in two geographically and genetically isolated populations in the northwestern mountains and the southern Sierra Nevada (Tucker et al. 2012). Apparent inconsistency between the central Sierra records reported by Grinnell et al. (1937) and the recent genetic work has not been resolved, but as detailed below, there is strong empirical evidence that geographic separation has existed for at least several decades and that a distribution gap persists at the present time.

Past survey efforts included systematic samples for fisher in 1991 using track plates and line-triggered cameras (Zielinski et al. 1997) between the southern Cascades and northern and central Sierra Nevada, south to Yosemite National Park (Map 2). No fishers were detected during these surveys in an area (i.e., gap) extending approximately 260 miles, north to south. Numerous broad scale systematic surveys for fishers and other forest carnivores were conducted within this distribution gap from 1996 to 2002 (Zielinski et al. 2005) and during 2002 to 2009 (Zielinski et al. 2013). During that period, no reliable fisher detections occurred across an approximately 260-mile region from the southern Cascades (eastern Shasta County) to the southern Sierra Nevada (Mariposa County). Zielinski et al. (2005) expressed concern about this gap primarily because it represented more than four times the maximum dispersal distance reported for fishers, and placed fishers in the southern Sierra Nevada at greater extinction risk due to isolation.

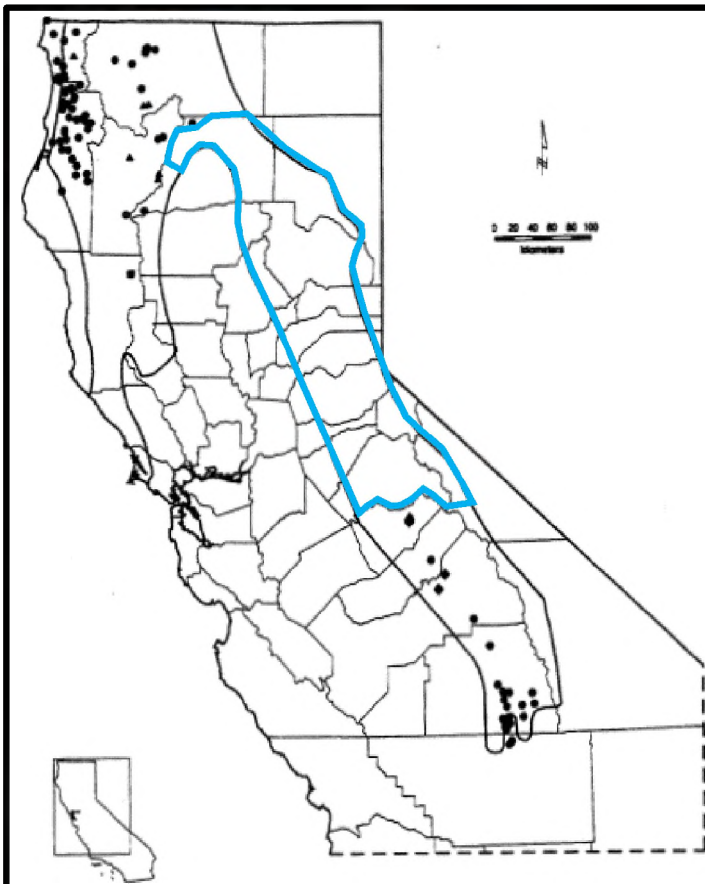


Figure 1. Locations in northern and central California where fishers **were detected**, 1989-1994. Circles indicate locations of surveys with multiple track-plate or line-triggered camera stations. Triangles indicate locations of individual 35-mm camera stations. Diamonds are locations of road-killed fishers, noted only for areas in the Sierra Nevada north of Sequoia National Forest. Yosemite National Park, in Mariposa County, is the site of two roadkills and two photographs, the symbols for which overlap considerably. The one solid square in Mendocino County is the location of two fisher captures, 3 months apart, in leg-hold traps set for other species. The bold irregular lines enclose the limits of historic fisher distribution as described by Grinnell et al. (1937). Outlines of counties also are shown.

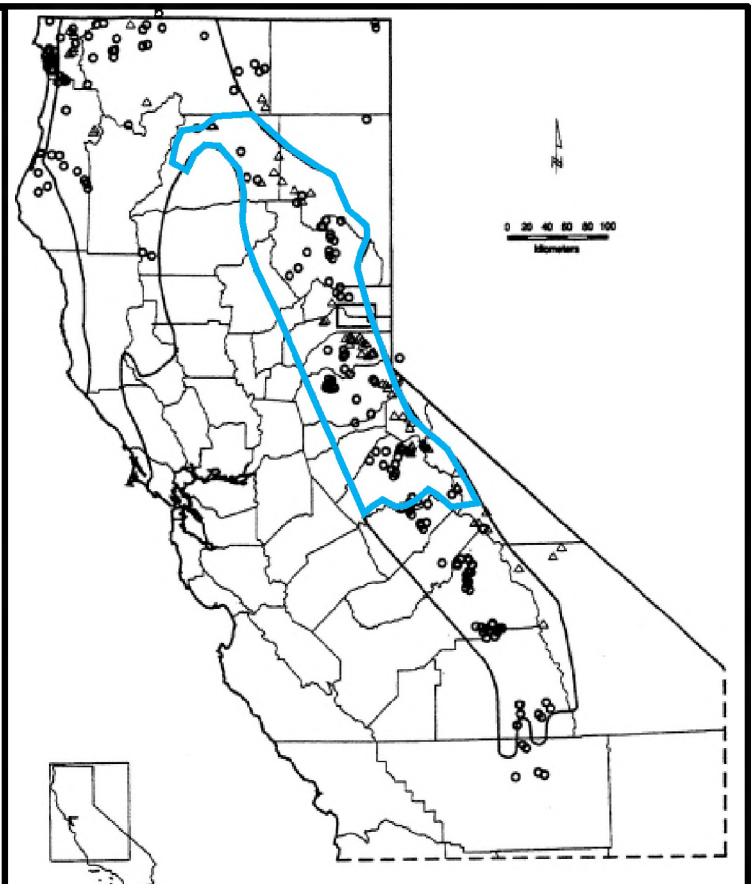


Figure 2. Locations in northern and central California where fishers **were not detected**, 1989-1994. Circles indicate locations of surveys with multiple track-plate or line-triggered camera stations. Triangles indicate locations of individual 35-mm camera stations. The large, open rectangle includes the Sierra Pilot Project study area where a 35-mm camera was placed at each of 150 section corners throughout the 800-km² area. The bold irregular lines enclose the limits of historic fisher distribution as described by Grinnell et al. (1937). Outlines of counties also are shown.

Map 2. From Zielinski et al. (1995) Figure 1 shows detection sample sites. Figure 2 shows non-detection sample sites. Blue outline added to show the 260-mile gap in the fisher distribution recognized in the publication.

Beginning in 2005, Sierra Pacific Industries (SPI) began sampling its ownership using the baited camera stations methodology described in Zielinski and Kucera (1995). As of 2020, over a million acres have been surveyed; nearly 750,000 acres of which occurs in the known fisher distribution gap (Map 3). Many of the SPI survey grids have been sampled multiple times since 2005. Data collection is ongoing during 2020 and SPI will continue to sample this area into the future.

In 2010, the California Dept. of Fish and Wildlife (CDFW 2010) estimated that the unoccupied portion of the original range represented approximately 43 percent of the assumed historical range in California described by Grinnell et al. (1937). This reduction was due to a distribution gap of approximately 180 mi. between the northern Sierra Nevada and the southern Sierra Nevada. (See Exhibit A for the 2010 estimated occupied range).

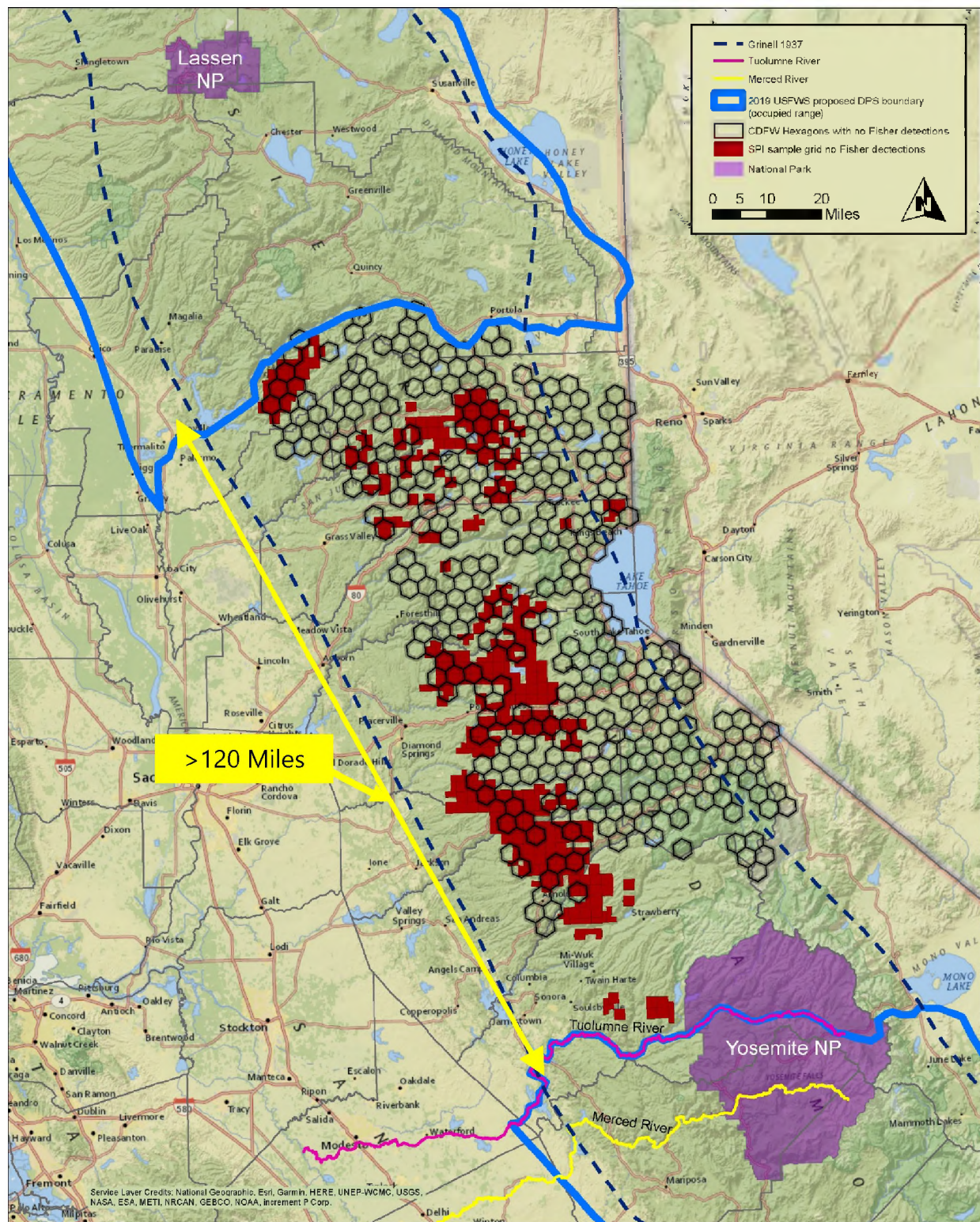
Between 2010 and 2018 the CDFW Region 2 sampled portions of a statewide grid system for carnivores within the fisher distribution gap area using remote camera surveys and a hexagon grid sampling scheme across a 1,935,000-acre area (Map 3). No fishers were detected in the sampled grids within the gap. However, CDFW's fisher status review (CDFW 2015) reported and mapped additional fisher locations further to the north, expanding the range of the northern California population to the east and southeast of their 2010 estimate.

As of late-2019, available fisher location data show the northern California population extending east into the southern Cascades and southerly into the Sierra Nevada, indicating that only 19 percent of the historic range now remains unoccupied less than a decade following the CDFW 2010 estimate of 43 percent (See Exhibit A showing this change from 2010 to 2019). The USFWS listing proposal (50 FR 60278) provided a map depicting the distribution gap as extending from the northern Sierra Nevada (apparently the Feather River area) south to the Tuolumne River. In 2017 only one male fisher had been found between the Merced River (the previous estimated northern boundary of the SSN) and the Tuolumne River. In 2020 the National Park Service reported detections from 4 camera stations and 2 scat dog detections in this area, indicating there are likely more fishers there now than in 2017

(<https://www.goldrushcam.com/sierrasuntimes/index.php/news/local-news/22113-yosemite-national-park-biologists-report-southern-sierra-nevada-fisher-caught-on-wildlife-camera>).

Per the latest data set (SPI and CDFW combined), the current distribution gap without fisher detections is approximately 120 miles, north to south, between the northern and southern Sierra Nevada. The reduction in the size of the gap from 260 miles (Zielinski et al. 1997) to 120 miles is the result of successful fisher reintroduction efforts conducted by the CDFW and SPI in the northern Sierra Nevada along with numerous surveys resulting in verifiable fisher detections in the southern Cascades (USFWS 2019, CDFW 2015, and unpublished data from CDFW and SPI, provided in public comments on the listing proposal and in this report.) Based upon Zielinski et al (2005). the continued existence of a 120-mile gap represents a distance two times the maximum dispersal distance reported for fishers.

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Map 3. 2019 USFWS proposed Distinct Population Segment (DPS) for fisher and protocol survey efforts of SPI and CDFW showing no fisher detections between the NCSSO and SSN populations (an approximately 120-mile gap). (these protocol surveys using baited camera stations from 2005 to 2019 suggest that the few random CNDDDB database locations in this gap from 1980 to 2008 are likely mistaken identifications) (See Exhibit A for more detection detail).

Persistence within the Occupied Range

Unpublished analyses of data collected by SPI in eastern Trinity County further demonstrate population trends at another site in this region. These data are contained in Exhibit B. In 2015, SPI deployed camera traps and hair snares following methodologies outlined in Zielinski and Kucera (1995), sampling eight four-square-mile blocks. DNA collected was submitted to the USFS Rocky Mountain Research Station (RMRS) for analyses of potential parent/offspring relationships between individuals sampled. DNA samples collected in an overlapping area in 2007 and 2008 (Reno et al. 2008) were also analyzed to determine if any fishers detected at that time were still present. Eight unique individuals (6M and 2F) were identified from the 2015 DNA (RMRS Report attached as Exhibit B). One of the male's genotypes was consistent with being the offspring of one of the 2015 females, indicating this managed landscape likely supports a breeding population of fishers. All 2015 individuals were unique from the samples collected in 2007 and 2008, indicating potential successful turnover/reproduction within this area. The sample represents a density of fishers of over 19 fishers per 100 square kilometers and is one of the highest densities reported (Self and Murphy 2008). This is also higher than the density reported in Reno et al. (2008) indicating the population in these overlapping areas is likely persisting and potentially growing, even after four fishers from this population were translocated to Stirling Management Area during 2009 through 2011 as part of the Cooperative northern sierra Nevada Fisher Reintroduction project,

Genetic Studies

Genetic studies have shown high divergence levels between fishers in northern California and the southern Sierra Nevada (Wisely et al. 2004, Knaus et al. 2011). Studies of fisher genetics in California also show fisher populations in the southern Sierra Nevada have been isolated from the northern Sierra Nevada and northwestern California at least since prior to Euro-American settlement (Knaus et al. 2011, Tucker et al. 2012).

Summary

Ongoing fisher conservation efforts in the form of baited camera stations have helped define the fisher distribution in California and genetic information shows two distinct northern and southern populations. The northern California population occurs in the Coast Range, Klamath Mountains, southern Cascade Range, and northern Sierra Nevada; while the southern population is limited to the southern Sierra Nevada. A significant distribution gap occurs in the central Sierra Nevada between these populations in areas considered part of the historic species range, and genetic research shows long-term

isolation between these two populations. The California fisher distribution has been stable and increasing recent years, particularly the northern California population (CDFW 2015). CDFW added "Evidence available to the Department indicates that fishers are widely distributed and common in northern California." Despite these trends, concerns regarding potential threats to fishers in California remain; however, these concerns are particularly elevated for the southern California population due to issues associated with geographic and genetic isolation from other fisher populations. Despite expressed concerns the northern California population appears to have expanded its range significantly over the last 9 years (See Exhibit A).

The CDFW considered these factors during their fisher status review (CDFW 2015) and concluded that the northern and southern fisher populations are distinct Evolutionarily Significant Units (ESU): the Northern California ESU and Southern Sierra Nevada ESU. Their status review (CDFW 2015) determined the Southern Sierra Nevada ESU warranted protections under the California Endangered Species Act (CESA) due to the distinction between these two populations and associated potential threat levels. The status review concluded that listing the fisher as threatened or endangered under CESA within the Northern California ESU was not warranted, and that listing the Southern Sierra Nevada ESU as threatened under CESA was warranted (CDFW 2015). The California Fish and Game Commission followed these conclusions and listed the Southern Sierra Nevada ESU as threatened under CESA, while determining that listing the Northern California ESU was not warranted (California Fish and Game Commission 2015).

Considering the CDFW conclusion, the numerous studies demonstrating genetic divergence of the SSN and the additional data presented in this report concerning the significant 120-mile gap between the northern California population and the SSN population that the only population that qualifies under the Services guidelines is the SSN. We conclude that the SSN population of the fisher is a distinct population segment from the NCSO population and should be treated separately.

Conservation Efforts of the “All Hands” Memo of Understanding (MOU)

In 2017, the USFS Pacific Southwest Region, the California Department of Forestry and Fire Protection (CAL FIRE), the National Fish and Wildlife Foundation (NFWF), and SPI signed a MOU outlining their collaboration to work together to conserve California spotted owls and other wildlife, including Pacific fisher, while coordinating wildfire risk reduction measures on federal, state, and SPI lands in the Sierra Nevada. This MOU was updated and extended in 2019 and again in 2020 to incorporate the fisher.

Under the MOU, the USFS, CAL FIRE, and SPI are coordinating fire management strategies, ensuring that treatments align across multiple ownerships to maximize efficacy, and sharing technical information regarding the location of sensitive wildlife habitats. The agreement leverages combined resources to establish a strategic conservation framework to help protect over two million acres of forestlands. NFWF is also a partner working on project proposals, grants and agreements, and leveraging available funding to maximize financial efficacy. The partners meet regularly at the regional and local levels to collaboratively implement current year projects and jointly plan out-year projects.

SPI recently worked with the MOU partners to establish a single Addendum to the 2020 MOU which expand this partnership to include the Commercial Forest Landowners in the ranges of the California and Northern spotted owls, including the range of the NCSO fisher subpopulation. The MOUs, titled Forest Fuels Reduction and Species Conservation in California, is between Green Diamond Resource Company, Humboldt Redwood Company LLC, Mendocino Redwood Company LLC, Fruit Growers Supply Company, TC&I-Shasta, Bascom Pacific LLC, W. M. Beatty and Associates, Hearst Forests LLC, Wyntoon Timberlands LLC, Michigan-California Timber Company, Shasta-Cascades Timberland Company, California Timberlands Investment, Soper Company, Collins Almanor Forest, and Sierra Pacific Industries (these entities collectively referred to as “Commercial Forest Landowners” or “CFLs”); joining with California Department of Forestry and Fire Protection (CALFIRE), referred to as “CAL FIRE”; NFWF, and the United States Department of Agriculture (USDA), USFS, Pacific Southwest Region. See Exhibit C for copies of the 2020 MOU and MOU Addendum.

As part of these ongoing cooperative efforts, CALFIRE has established a website where all completed fuelbreaks and fuels reduction projects can be viewed. The ongoing scale of this effort can be viewed at url:

http://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fegis.fire.ca.gov%2Farcgis%2Frest%2Fservices%2FCalMapper%2FCalMAPPER_Public%2FMapServer&source=sd.

Since signing the first MOU in 2017, planned, in-progress, and completed fuels reduction treatments on National Forest System (NFS) lands alone within the range of the DPS, have totaled 1,110,421 acres. SPI has completed 728 miles of fuel breaks covering 25,653 acres, with 466 miles planned or proposed adding an additional 25,289 acres. Maintenance treatments on existing fuel breaks will cover 7,811 acres in 2020.

The CFLs manage nearly 4 million acres within the range of fisher in northern California and in the MOU addendum they have committed to undertake activities consistent with the conservation needs of fisher while implementing this MOU Addendum, including the following:

- Avoid the poisoning of mountain beavers, porcupines, snowshoe hares, and woodrats;
- Retain known fisher natal dens;
- Retain or recruit a hardwood component (if available) for mast production and future dens;
- Retain or recruit structurally diverse forests; and
- Retain shrubs and smaller trees in areas with sparse overstory cover.

The first bullet item above recognizes the importance of these known fisher prey species. More detail on structural retention being provided under ESA Section 10 permits is provided below in this document.

The above described efforts are designed to reduce the threat of wildfires in fisher habitat. The proposed rule estimates that 7% of fisher habitat described as intermediate or high quality was affected by high severity wildfire during ten years beginning in 2008 (84 FR 60278, 60288) but does not present a conclusion as to the effects of this assumed loss on fishers in the NCSO in the past or the future. We have noted that issues with both the method of estimating the quantity and the habitat description leave that estimate of loss in considerable doubt. In the following paragraphs, we evaluate the effect of that amount of loss, if it were indeed actual. Note that the proposed rule presented no discussion similar to the following.

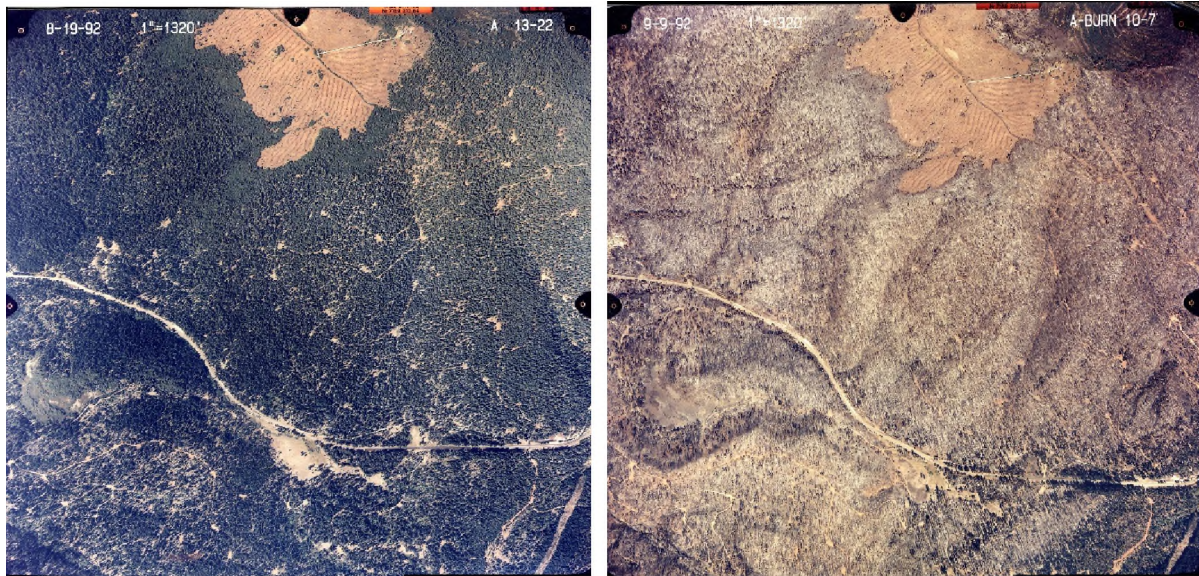
A loss of 7 percent per decade spread over the proposed rule's defined "foreseeable future" of 35-40 years would result in loss of 24 to 28% of the baseline amount of habitat across the NCSO. Powell et al. (2019, p.23-27) (which was supplied to the

Service in July 2019 and in an updated version in December 2019) analyzed the potential risk of extinction of the introduced population at SPI's Stirling Management Area, using the present distribution of habitat seral stages and SPI's modeled forest growth. They simulated the risk of extinction associated with a single large wildfire event at year 10. The extinction risk for the local fisher population did not exceed 0.25 unless over 40% of the simulated area burned in that single year, and did not exceed 0.5 unless the amount of area burned exceeded 50 percent of the simulated area in that single event. The population decreased for about ten years after the event, then began to rebound as re-planted forest began to reach a closed canopy condition. The authors noted that the SPI's management regime improved the habitat recovery rate, and also stated that if the modeled wildfire event instead took place when additional older forest was present and the fisher population larger, "...we expect that the extinction index would not be as large."

Although these modeling results cannot be directly applied to the entire NCSO range, they do indicate that even with short-term, high intensity habitat loss, fisher extinction risk is relatively low. Based on the modeling by Powell et al. (2019, loss of habitat over the foreseeable future to the degree envisioned by the proposed rule should not be presumed to carry an important risk of extinction across a large area. The proposed rule did not demonstrate any attempt to consider the risk of extinction associated with estimated habitat loss to wildfire. Based on the best available scientific information, that risk is relatively low.

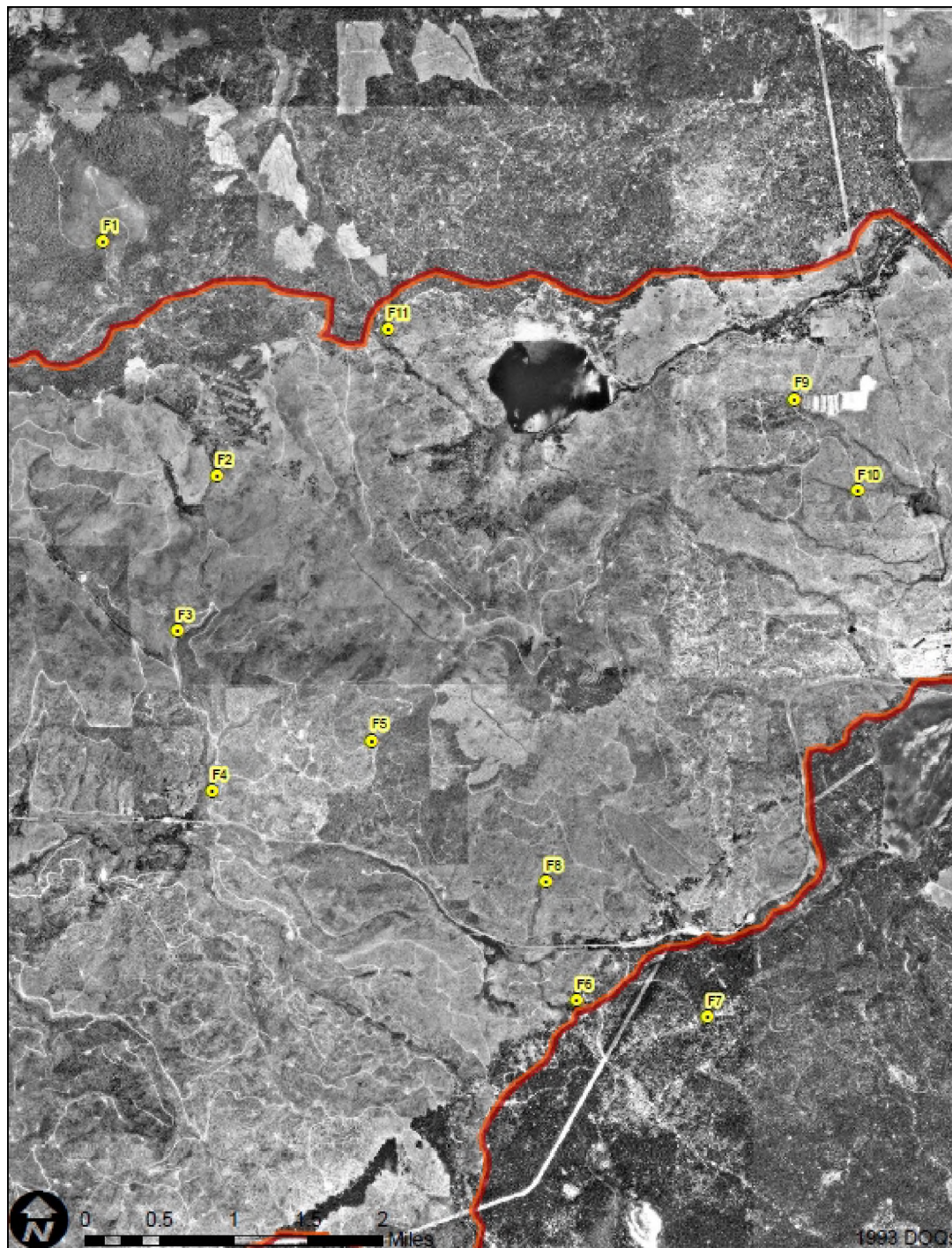
[A Case Study of Post Fire Recovery – The Fountain Fire 19 years after planting.](#)

On August 20, 1992 the Fountain Fire ignited along Buzzard Roost Road in Oak Run, California (Shasta County). The fire was contained eight days later and would become one of the most devastating fires in California history at the time; consuming 64,000 acres in a little over three days and destroying 272 homes and 489 outbuildings. At the time of ignition, the north state had experienced 6 years of drought and 22 consecutive days of 100°F with wind speeds exceeding 20 mph at the time of ignition, resulting in extreme fire conditions that killed nearly all trees within the perimeter of the fire (Zhang et al. 2008, Skinner and Taylor 2006). Most of the lands within the Fountain Fire footprint were privately owned, with 65% of the lands owned by industrial timber management companies (Zhang et al. 2008).



Aerial Photos taken 8/19/1992, one day prior to the Fountain Fire and twenty days later, showing the impact of the catastrophic fire. The area shown in the upper center of both photos was a brush field rehabilitation finished one year before the fire.

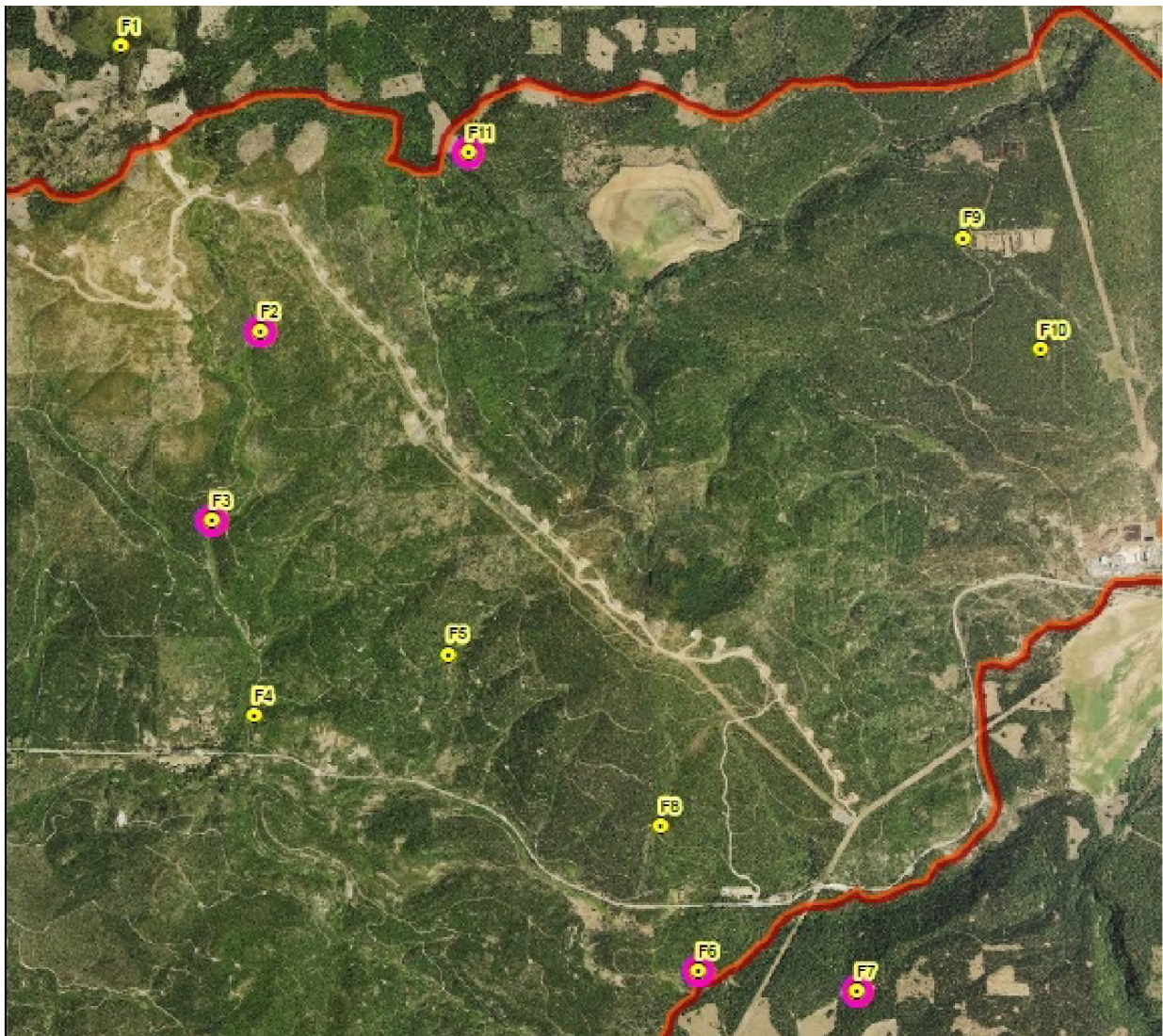
Immediately following the fire, all industrial land owners implemented salvage operations as allowed under the California Forest Practices Act and Rules. The California Forest Practice Act allows landowners to immediately recoup the cost by harvesting trees within substantially damaged timberlands while preventing any additional potential significant environmental impacts from the logging operations. Due to the extreme fire conditions during the Fountain Fire, there were few, if any, live trees within the footprint to retain as future habitat elements. Additionally, at the time of the salvage operations, it was not common practice to retain any trees within a fire perimeter as the value of retention to future stands was not yet fully understood nor was retention required. Due to the wind driven fire, after salvage operations were completed, a swath of unforested habitat over 7 miles across at its widest point was left. In the years immediately following salvage operations, all industrial timber owners voluntarily replanted their lands with over 17 million seedlings of multiple conifer species (Zhang et al. 2008).



This 1993 digital ortho quad image shows the post-harvest condition and perimeter of the eastern portion of the Fountain Fire and SPI's 2015 baited camera survey stations.

On the eastern portion of the fire, along the ridgeline of Hatchet Mountain and extending east towards Burney, SPI owns about 10,000 acres that span the entire width of the fire footprint. As described above, all lands that burned were salvaged and subsequently planted from 1994 through 1996 following salvage operations. Very few trees/structures (i.e., potential fisher den/rest sites) were retained across the landscape

because of the severity of the burn and the thorough salvage harvest. Herbicide treatments were used to control competing vegetation to allow faster/more effective conifer seedling establishment.



This 2014 NAIP ortho image shows the reforested condition and perimeter of the eastern portion of the Fountain Fire and SPI's 2015 baited camera survey stations. The pink circles indicate fisher detections in 2015. Also, in this image 44 windmills of the Hatchet Ridge Wind Renewable Energy Project can be seen. In 2016 additional detections occurred at stations those identified above in 2015 and F10.

In the late winter of 2015 and 2016, camera stations were deployed on SPI lands within the historic burn area to determine the presence of fisher within the 19- to 21-year-old planted forest (stand age was variable due to planting taking multiple years to complete). In 2015 and in 2016 three and four cameras within the Fountain Fire perimeter had positive fisher detections. In 2015, fishers were detected at two stations, located over 6 miles from each other and over 2.5 miles interior from the burn perimeter; potentially indicating a large portion of, or the entire home range of, two

unique fishers are located within this 19- to 21-year-old planted forest. Additionally, based on the size comparison of fishers detected on camera, it is likely both male and female and/or juvenile fishers are occupying portions of this area, indicating potential reproduction. Hair samples collected at each camera station have been submitted for analysis to confirm number of individuals present and pedigrees between individuals to confirm reproduction.



These images show some of the fisher detections in the Fountain Fire at SPI's 2015 baited camera survey stations.

Given the lack of any residual tree component after salvage operations, the detections of fishers approximately 19 years after planting, and the potential for this area of planted even aged forest to be supporting reproducing fishers (based on size of individuals), it is arguable that that fire does not pose a long term threat to the species as long as proper reforestation measures are taken post fire.

Rodenticides and Cannabis Cultivation

The threat of rodenticides associated with illegal cannabis cultivation to fishers is well documented and represents a potential species stressor. Recent changes in California regarding cannabis legalization and associated regulations governing cultivation are establishing a trend towards reduced potential species threats from illegal cannabis cultivation. Additional measures taken by private forestland owners and the USFS further contribute to this trend. These recent changes and private forest landowner measures are detailed below.

California Commercial Cannabis Cultivation

Regulatory Framework

Beginning in January 2018 California implemented a framework under which commercial cannabis activity must be licensed, legal, taxed, and regulated. California's Business and Professions Code requires commercial cannabis cultivators obtain a license from the California Department of Food and Agriculture (CDFA). The CDFA, California Department of Public Health, and the Bureau of Cannabis Control began issuing licenses to cultivate, manufacture, distribute, test, and sell commercial cannabis for both medicinal and adult/ recreational use. The CDFA includes two branches responsible for overall commercial cannabis regulation.

The CDFA Licensing Branch is responsible for reviewing cultivation license applications prior to issuance. Application review consists of an administrative and environmental review, including environmental protection measures (pest management plan, water sources, etc.) and California Environmental Quality Act (CEQA) documentation. The CDFA licensing branch also has a team of field scientists who participate in field inspections of licensed cultivation sites to ensure that cultivators are following all environmental protection measures outlined in CDFA's cannabis cultivation regulations.

The CDFA Compliance and Enforcement Branch is responsible for cannabis cultivation site inspections, investigations, and administrative actions. The branch is currently established four geographic regions: North Coast, Central Valley, Central Coast, and Southern California; and may expand to six regions with staff located statewide. Additionally, the branch facilitates contracts with various County Agricultural Commissioner offices in permissive jurisdictions to conduct inspections at licensed cannabis cultivation sites on behalf of CDFA.

The California Department of Fish and Wildlife (CDFW) also has a significant role in regulating permits for commercial cannabis cultivation in California. This role includes fish and wildlife resource protection from potential impacts relating to cannabis

cultivation such as pollution from pesticides and fertilizers, stream diversions, migration barriers and sedimentation from stream crossings, cultivation site development impacts from habitat loss and fragmentation, and related impacts following initial development including road use, noise, and artificial light.

California code specifies that a CDFA commercial cannabis cultivation license is not effective until the Applicant has complied with a CDFW permitting requirement relating to lake or streambed alterations. The CDFA regulations require applicants to provide a CDFW Lake and Streambed Alteration (LSA) Agreement, or written verification that one is not required. CDFW's LSA Program is responsible for permitting projects that would substantially alter any river, stream, or lake, and that may substantially adversely affect an existing fish or wildlife resource. An LSA Agreement includes measures to protect fish and wildlife resources. Additionally, CDFW is authorized to add any conditions to a LAS Agreement deemed necessary to protect fish and wildlife directly into the commercial cultivation license. CDFW teams from their Wildlife and Fisheries Branches are developing a statewide monitoring program for wildlife that may be impacted by cannabis cultivation. Results from these monitoring efforts will provide valuable insight into measures included in permits for cannabis cultivators.

Other state agencies participating in the commercial cannabis regulatory framework include the California Water Resources Control Board (CWRCB) and the California Department of Pesticide Regulation (DPR). The CWRCB maintains a cannabis policy is to ensure that water diversion and waste discharge associated with cannabis cultivation does not negatively impact water quality, aquatic habitat, riparian habitat, wetlands, and springs. THE CWRCB also participates in enforcement activities with the CDFW. The DPR provides statewide guidance on pesticide use in cannabis cultivation, guidance to the Bureau of Cannabis Control on testing for pesticides, and require that pesticides being applied to cannabis comply with food and agriculture standards. The CWRCB and DPR requirements are implemented through the CDFA commercial cannabis licensing program.

Illegal Cultivation Reclamation and Enforcement Programs

The CDFW participation also includes administering the Cannabis Restoration Grant Program created to provide funding for illegal cannabis site reclamation projects. These reclamation activities include removal of trash, irrigation pipe, fertilizer, pesticides, and water diversions at illegal cultivation sites. This program provided \$1.3 million supporting reclamation projects during 2018. Other organizations have recently formed and raise funding for illegal cultivation site reclamation and related activities in California. For example, the Cannabis Removal on Public Lands Program (CROP) (<https://www.cropproject.org/>) has been organized to secure and increase state and

federal resources for reclamation projects, increase USFS law enforcement and overall presence in National Forests, and implement a statewide public education campaign focusing on the human health risks associated with ingesting unregulated cannabis.

Measures on Private Forestlands

Further reducing the threat of rodenticides as a stressor, large private forest landowners within the fisher geographic range have implemented increased measures to reduce illegal marijuana cultivation in recent years, which is the primary cause of rodenticides occurring in fisher habitat. Approximately 2.3 million acres of private timberlands in California are currently enrolled in Endangered Species Act Section 10 permits that include conservation measures addressing illegal cannabis cultivation. These measures include limiting or closing physical access, limiting or closing vehicular access by establishing an increased gated road network, and augmenting overall land protection by increasing patrol efforts. Illegal cannabis cultivation on these private lands is minimized as a result and occupy very minor amounts of these land ownerships. For example, illegal cultivation activities on SPI's extensive ownership has been limited to six illegal grow sites during each of the 2017 and 2018 calendar years. These grow sites were small, ranging from less than one- to approximately three-acres in size (assuming 3 acres each, these sites represent 0.0009 percent of SPI's land base over two years); and all grow sites have been fully remediated following law enforcement activities. These efforts continue annually; for example, SPI also installed 52 new gates and remote cameras across these lands during 2018 to further assist enforcement actions.

Trends toward reduced potential species threats from illegal cannabis cultivation are also continuing on federal lands in California. These trends are associated with cannabis legalization and increased enforcement actions, and summarized by recent studies; Klassen and Anthony (2019) concluded that legalized cannabis contributed to fewer discovered illegal cannabis grow operations in National Forests, and Prestemon et al. (2019) found that policies legalizing recreational marijuana are associated with a greater than 20 percent reduction in the number of reported illegal grow operations on National Forest lands.

Additionally, illegal cannabis cultivation has received recent Congressional-level attention. For example, during 2018 California Congressmen Doug LaMalfa and Jared Huffman introduced H.R. 7018, the Protecting Lands Against Narcotics Trafficking (PLANT) Act. This pending legislation provides resources to help local, state, and federal law enforcement eradicate illegal marijuana grows on public lands, increases fines and penalties for illegally producing marijuana on public lands, and establishes a fund to restore lands damaged by illegal cultivation activities paid for through fines imposed on illegal growers.

In a very comprehensive survey of both legal and illegal cultivation sites in Humboldt County, Butsic and Brenner (2016) determined that in total 494.2 acres were in cultivation, comprising 0.019 percent of Humboldt County's 2,592,135 acres. This provides perspective on the actual impact in terms of total area. On much of that area anti-coagulant rodenticides are not used because they are prohibited on legal cultivation sites.

Given legalization and regulation of the legal cannabis market, increased enforcement at illegal sites, and increased restoration, including toxicant removal, at illegal cannabis cultivation sites, it is reasonable to expect that this potential threat will continue decreasing in the foreseeable future.

Conservation Efforts that mitigate timber harvest threats to fishers in their northern California Range

The USFWS (Service) proposal to list the fisher under the US Endangered Species Act (ESA) (50 CFR 60278) discussed issues of habitat loss caused by vegetation management. Potential threats from two types of vegetation management were identified: reduction of wildfire risk and timber harvest but the proposed rule did not include a detailed analysis of existing measures to address these threats. This paper discusses existing conservation efforts and regulatory programs that reduce potential threats to fishers from timber harvest on private industrial lands in northern California.

Private lands comprise about 50 percent of the acreage of forest lands within the northern California range of the fisher (SPI in-house GIS). The USFS manages 42 percent, with Other Public 8 percent. Twenty-eight industrial timber companies own about 19 percent of these private lands.

Volume per acre of timber harvest is highly variable due to differing harvest methods and tree sizes. Overall harvested volume and acreage also may vary annually due to market conditions and impacts of wildfire. Statistics for total acreage of timber harvest are not collected by any agency. Statistics on total harvest acreage are not useful in estimating effects because harvest methods and post-harvest character of stands vary widely. In terms of effects to habitat, acreage of clearcut harvest may represent the most easily quantifiable and most obvious effect to forested habitat, at least in the short term. (See later discussion for more detail.)

Industrial timber companies in the northern California range of the fisher harvest timber under selection methods and under even-aged management that includes clearcut harvesting. The use of various methods depends upon short- and long-term economic objectives, and upon site conditions and regulatory standards. Some companies use both selection and clearcut harvest methods to varying degrees.

All private timber harvest on California is governed by the California Forest Practice Rules (CFPRs), which provide standards for protection of habitat for spotted owls and aquatic organisms. The CFPRs require sustainable management plans for timber yields for all landowners over 50,000 acres. The CFPRS prohibit approval of Timber Harvest Plans (THPs) that would result in take of species listed under the state and federal ESAs, unless that take is authorized under other laws (e.g., ESA Section 10 Habitat Conservation Plans (HCPs), or Candidate Conservation Agreements with Assurances (CCAAs)). Two industrial timber companies (Humboldt Redwood Company and Green Diamond Resource Company) operate under existing HCPs and Candidate Conservation Agreements with Assurances (CCAAs) that cover northern spotted owls, fishers, other

terrestrial forest animals, and aquatic fish and wildlife to varying degrees. Another (Sierra Pacific Industries) operates under an existing CCAA for fishers and is in negotiations with the Service and the National Marine Fisheries Service regarding an HCP for northern spotted owls and California spotted owls, and an HCP/Safe Harbor Agreement (SHA) for anadromous fish. Also, several timber companies operate under "no-take" agreements with the Service regarding northern spotted owls. Habitat protections for spotted owls and aquatic organisms probably provide protections for fisher habitat as well, even if not specifically designed for that purpose.

As a result of varying harvest practices amid overlapping and variable regulatory mechanisms, it is not possible to make brief, precise statements about the potential effects of timber harvest or about the effectiveness of existing regulatory mechanisms in reducing these threats. Generally speaking, selection harvest methods that leave a closed overstory canopy probably have lower short-term effects than clearcutting. The effects of clear-cutting are not permanent, as re-planted stands (required by the CFPRs) are known to be occupied by fisher (at least for foraging) within a few decades of replanting (See Fountain Fire Case Study). Effects of harvest on fisher prey species may be variable - for instance young planted stands are known to provide habitat for woodrats, a prey species for fishers.

[Sierra Pacific Industries \(SPI\). Habitat Use and Effects of Forest Management After Successful Reintroduction on the Stirling Management Area](#)

The proposed rule also omits data contained in Powell et al. (2019), a study of fishers from the Stirling reintroduction area through 2017, which was submitted in final draft to the Service in August 2019 (corrected version submitted December 2019). Powell et al. (2019) stated that "[o]ur best estimates of survival and reproduction are consistent with a stable or growing population on Stirling." Powell et al. (2019) differs somewhat from the studies performed by Higley et al. (2014) and Green et al. (2019) in that it was initiated in an area newly occupied by introduced fishers; however, many similarities between these studies also exist. Powell et al. (2019) ultimately concluded that "the fisher population on Stirling is growing, but neither short-term population stability nor long-term viability will be demonstrable statistically before year-10 (2020)." Modeling of future habitat under SPI's HCP projected habitat was used by Powell et al. (2019) and showed an increase in carrying capacity on the Stirling Management Area over the next 50 years.

Retention or Recruitment of Habitat Elements

Retention or recruitment of habitat elements such as large live hardwoods, large conifer and hardwood snags, and large woody debris is key to providing long-term habitat for fishers within a managed forest environment, regardless of harvest methods. Fishers are known to use these elements for breeding and resting in forests managed for selection timber harvest and in forests regenerating from clearcut harvest or wildfire (for instance, see Niblett et al 2017 and Klug et al. 1997). Subject to safety requirements during harvest operations, mandatory retention of such habitat elements is a standard conservation measure in HCPs and CCAAs for spotted owls and fishers. CALFIRE enforces compliance with retention standards for snags that do not pose hazards for worker safety or wildfire. Non-mandatory retention has increasingly become standard practice for companies without HCPs as well.

Retaining habitat elements provides a mitigation that reduces both short-term and long-term impacts of timber harvest. This mitigation should be recognized in any assessment of impacts of timber harvest on fishers.

It is also important to note that the amount of large-tree closed canopy forest is projected to increase over the next several decades on the properties of several large timber companies, as further described below. This factor was not assessed in the Service's proposed rule.

In the following sections, we provide summaries of the retention strategies employed by several northern California timber companies. The discussion also includes projections of trends in large-tree closed-canopy forest on these ownerships. These retention standards are expected to provide a well distributed older component of trees currently providing denning sites for fishers and these retention standards will provide future conditions that will recruit these structural elements into future forests.

Humboldt Redwood Company (HRC), (Humboldt County)

HRC owns and manages the lands formerly owned by the Pacific Lumber Company (PALCO). In 1999, the Service, CDFG, NOAA, and CDF approved PALCO's multi-species HCP that included spotted owls and fishers among the 17 total covered species. The HCP covers approximately 211,000 acres with redwood, Douglas-fir, and hardwood forests known to be occupied by fishers. In 2008, upon acquiring the PALCO holdings out of bankruptcy, HRC adopted the forest management strategies of its associate company, Mendocino Redwood Company, including an immediate change from even-age management (clear cut silviculture) to uneven-age, or selection silviculture, retention of all old growth trees on the landscape meeting the company's policy, and a reduction in annual harvest levels from 175 million board feet (mmbf) per year to

approximately 55 mmbf per year over the first ten-year period (S. Chinnici, pers. comm.). Approximately 29,200 acres (14 percent of the property) is currently included in wildlife reserves, riparian buffers and geologically unstable areas where harvest is prohibited. Potential fisher habitat (defined here as combined mid-successional, late seral, and old growth) will increase during the next 40 years (i.e., the "foreseeable future" defined by the proposed rule) (HCP figure 5 and 6). Retention standards in the revised HCP and in THPs applying to old-growth trees, late-seral habitat, large hardwoods, large snags and logs, etc. are included in Attachments HRC-A (Revised HCP available at <https://www.fws.gov/arcata/es/HCP.html>), HRC-B (example THP language regarding snags) and HRC-C (2013 HRC HCP Structural Components Evaluation).

Green Diamond Resource Company (GDRC), (Humboldt and Del Norte Counties)

GDRC operates under an HCP for forest species including northern spotted owls and fishers approved by the Service in 2019. The HCP covers approximately 365,000 acres, all of which are within the NCSO. The property, much of which has been extensively managed since the early 1900s, is known to be occupied by fishers at relatively high densities (Thompson 2008). Recent survey work on GDRC lands inside the NCSO occupied range suggests that density on their study site is likely increasing. Harvest methods on GDRC include both clearcutting and selection. While the overall trend in modeled high value foraging habitat will decline in the next 20 years, it will then stabilize (HCP Fig. 4-11). Approximately 25 percent of the property is included in riparian buffers and geologically unstable areas where harvest is further restricted; in riparian zones, average age of stands will increase over the "foreseeable future" described by the listing proposal (HCP Fig.4-10). Retention standards include two qualifying evergreen hardwoods with high wildlife values in every clearcut unit where they exist, with additional trees retained as necessary to meet an overall retention of 10 percent of existing basal area. Detailed retention standards applying to wildlife trees, large hardwoods, large snags and logs, etc. are included in the HCP available at <https://www.fws.gov/arcata/es/HCP.html> and examples of GDRC efforts are included as Attachment GDRC-1.

Sierra Pacific Industries (SPI). (Siskiyou, Modoc, Trinity, Shasta, Tehama, Lassen, Plumas, Butte, Tahoe, Eldorado, Stanislaus, Tuolumne Counties)

SPI's 1.6-million-acre ownership includes about 600,000 acres within the current northern California range of the fisher. This entire 1.6-million-acre area is covered by a fisher CCAA approved by the Service in 2016. Fishers are known to occur on SPI's ownership across much of this area, and 40 fishers were introduced into SPI's Stirling management area in Butte County during 2009 through 2011. SPI plans for even-aged management with clearcut harvesting on approximately 70 percent of the whole

ownership over the next 50 years (approximately 30% of the whole ownership has been regenerated so far). Approximately 15 percent of the property is included in riparian buffers and geologically unstable areas where harvest is further restricted and another 15% is located in areas SPI has chosen not to utilize even-aged management. In 2019, SPI submitted a public review draft of its northern spotted owl and California spotted owl HCP; this HCP is currently in final negotiations with the Service. In that document, habitat suitable for spotted owl nesting and support (Potential Habitat Areas (PHAs)) (assumed to be fisher denning habitat as well) is projected to increase from 589,642 acres (37.6% of SPI's lands) to over 1,135,604 acres (72% of the SPI land base) during the next 50 years. This habitat is the same habitat that exists and under management will increase on the Stirling Management Area, site of the successful reintroduction and establishment of a new population. Retention standards in the draft HCP are nearly identical to those of the fisher CCAA, and when approved, will extend those standards for a 50-year period with increased monitoring. CCAA and HCP retention standards applying to large hardwoods, large snags and logs, etc. are included in Attachment SPI-A.

[Michigan-California Timber Company \(MCTC\) on its 108,000-acre ownership \(Siskiyou, Shasta Counties\) An example of a company that provides benefit for fisher without using a Section 10 process.](#)

Habitat Measures

- Retain large hardwood trees
- Retain trees with cavities
- Retain "wolfy" trees
- Retain live culls
- Retain unmerchantable snags
- Retain advanced regeneration in clearcut units
- Bioforestry program retains approximately 2% of clearcut units in aggregated retention at least 1/10th acre in size generally around habitat elements not likely to be created in the planted stand (large hardwoods, trees with cavities, wolfy trees, live culls, large snags, large downed logs)
- Watercourse and Lake Protection Zones (WLPZ): 4.6% of the MCTC ownership-these areas have little to no harvest in them
- Salamander habitat retention patches (difficult to quantify acreage)
- Easement Special Habitat Management Zones and other areas for northern goshawk (approximately 700 acres)

Spotted Owl Management Plan (SOMP)

MCTC has a SOMP with the U.S. Fish and Wildlife Service (Service) which was signed in 2018 and which is effective for ten years (with an automatic renewal of five years in

2023). The SOMP is a binding agreement which details mitigations that MCTC must implement to conduct timber management activities within the range of the northern spotted owl. The mitigations in the SOMP benefit pacific fisher as well. One of the major mitigations in the SOMP is a requirement to designate around NSO activity centers “No Take Habitats” where any harvest is focused on habitat improvement, not timber production, and must be approved by the Service. Very little harvest has occurred in No Take Habitats which comprise approximately 5% of the ownership (this percentage is additional to the WLPZ acreage delineated above).

Fuel Reduction Efforts

- Thinning exemptions on 1,907 acres since 2015 resulting in increased fire resilience and enhancing stand development
- 73-acre fuelbreak in the Black Butte Tract along railroad tracks and developed properties (length of approximately 3 miles)
- Clearing of right-of-way along almost 400 miles of roads since 2015 resulting in better access for fire suppression efforts
- Fish and Wildlife Service Partners program – cattle exclusion fencing, meadow and aspen enhancement
- THP process ensures that, post-harvest, an array of forest size classes are provided at the landscape level

Marijuana Cultivation

- Hire separate patrolman under contract to watch over properties which limits cultivation efforts
- Active management/presence by MCTC personnel limits cultivation efforts-we report cultivation sites to the authorities
- Installation and maintenance of gates on the property to limit access
- Actively involved in the clean-up of discovered grow sites found on MCTC

Other Information

- MCTC has documented range expansion in the vicinity of our Black Butte Tract (between Weed and Mt. Shasta City in Siskiyou County). Surveys conducted by MCTC between December 2014 and January 2015 found fishers in all three sampling areas. Fishers were again found in this area during surveys conducted under the direction of the U.S. Fish and Wildlife Service in fall of 2019. This area is now in a Conservation easement.
- MCTC is an active participant in the Eastern Klamath Study Area (EKSA).
- Donor fisher removed from MCTC and vicinity for translocation to Stirling District
- Fisher populations increasing in EKSA, prior to the Beaver Fire, which reduced the levels back to the beginning of the study period.

As described above in the all hands approach to wildfire and fuels reduction, The CFLs manage nearly 4 million acres within the range of fisher in Northern California and in the MOU addendum they have committed to undertake activities consistent with the conservation needs of fisher while implementing this MOU Addendum, including the following:

- Avoid the poisoning of mountain beavers, porcupines, snowshoe hares, and woodrats;
- Retain known fisher natal dens;
- Retain or recruit a hardwood component (if available) for mast production and future dens;
- Retain or recruit structurally diverse forests; and
- Retain shrubs and smaller trees in areas with sparse overstory cover.

The first bullet item above recognizes the importance of these known fisher prey species.

Summary

Given the significant contributions to increasing fisher denning and resting habitat in the three Section 10 permits (covering 2.3 million acres), the maintenance and recruitment of denning and resting structural components across the entire private land base (covering nearly 2 million more acres), the all hands effort to reduce wildfire effects, and the modeled increase in carrying capacity under the CFPRs sustained yield requirements (Powell et al. 2019) it should be evident that timber management is no longer a significant threat to fishers over the foreseeable future.

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