

COMPETING RISKS AND VULNERABILITY OF THE SOUTHERN SIERRA NEVADA FISHER POPULATION Dr. Wayne Spencer, Director of Conservation Assessment and Planning, Conservation Biology Institute

Abstract: The population of Pacific fishers (*Martes pennanti*) in the southern Sierra Nevada has been genetically isolated since before European settlement and has experienced about a 90% decline in effective populations size. Following substantial range and population reductions during the 20th Century due to logging, fur trapping, and other persecution, the current population of <300 adults seems stable. However, the population continues to be threatened by numerous interacting factors, including habitat alteration, environmental contamination, roadkill, abnormally high predation rates, increasing risk of stand-replacing wildfires, and, of course, climate change. Intensive field studies coupled with landscape-scale habitat, population, and vegetation-change models are helping guide conservation planning for the fisher. The models suggest that the population should actually be expanding to re-occupy suitable and recovering habitat areas, but that elevated mortality rates due to anthropomorphic factors are preventing expansion. Predation, especially by bobcats and mountain lions, is the principal cause of fatalities, and predation rates are probably elevated due to habitat fragmentation and roads, which facilitate access by larger predators into densely forested fisher habitats. Additional mortality factors include roadkill, diseases carried by cats and dogs, and pervasive poisoning by rodenticides and other chemical contaminants at marijuana grow sites. These poisons can kill fishers outright, increase their susceptibility to predation and other risks, and reduce prey availability. Landscape dynamics models suggest that increasing fire risks could further reduce and fragment the population, and that although vegetation treatments (e.g., thinning) may have local, short-term, adverse effects on fishers, they may benefit fishers in the long term by reducing the risks of large, severe fires. Climate change models suggest that fisher habitat will decline precipitously during the next century, but there are huge uncertainties in these predictions. Forest management should strive to balance the competing risks represented by fires and vegetation treatments to maximize sustainability of mature and dense forest conditions in the mixed-conifer zone, while also working aggressively to reduce direct mortality threats by remediating marijuana grow sites, providing road-crossing structures where needed, closing and revegetating old roads, and reducing fragmentation of dense, mixed coniferous stands. Whether there will be sufficient climate refugia to sustain this southernmost population of fishers in the longer term needs further evaluation.