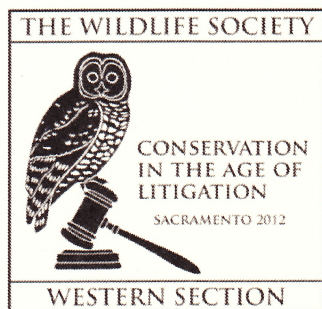


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late-seral habitat elements that may benefit fishers. Although the FPRs lack specificity relative to fisher habitat, many of the larger commercial timberland owners have various additional measures that should benefit fishers. The practices include those required by habitat conservation plans (HCPs), third-party certification measures, and voluntary measures provided by various commercial timberland owners. The measures that will most likely benefit fishers include retention standards for individual large trees, groups of trees with late-seral habitat elements, snags and downed wood, and hardwood retention. It is difficult to quantify the overall effect of these various measures, but we believe there is evidence for an improving trend relative to practices in the past.

FISHERS, FORESTRY, AND FELLER-BUNCHERS: GETTING FOREST LICENSEES INVOLVED IN FISHER HABITAT CONSERVATION IN BRITISH COLUMBIA

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Research over the past 20 years has identified many opportunities for forest licensees and management agencies to improve their ability to sustainably manage fisher habitat within their forest operations. This body of knowledge has clearly identified that fishers rely upon forests for 3 major life requisites: reproductive habitat, thermal/security habitat, and foraging habitat. Opportunities exist during all phases of forest management (planning, harvesting, regeneration/post-harvest treatments) to incorporate decisions that may positively affect the supply of these habitats for fishers. We developed a program to provide information to a variety of practitioners who make decisions that affect the conservation, maintenance, and recruitment of forest components needed by fishers. Using the best available science from 4 recent research projects conducted throughout the range of fishers in British Columbia, we developed targeted extension material that will assist practitioners in making better informed decisions, and will provide them with practical tools to achieve more sustainable outcomes with regards to fisher habitat. This extension program helps the forest sector achieve the overarching goals of increased public trust in forest sector productivity, stewardship, and sustainable forest management practices; increases the use of science, experiential, and indigenous knowledge in forest policies, plans, and practices; and helps British Columbia become a global leader in forest stewardship and environmental management. This extension project ensures access to and use of the best available science and experience to support science-based sustainable forest management policy, planning, and operational decisions in British Columbia. It will foster innovative technology transfer and participatory extension strategies by drawing on the knowledge and experience of researchers, resource users, academics, and policy and operational experts.



DISEASE AND PREDATION IN FISHER POPULATIONS – PARADIGM SHIFTS, FUTURE APPROACHES AND MANAGEMENT OPTIONS

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Disease and predation were once believed to have minor impact on fisher populations, but recent studies have identified both as the two most common causes of mortality in California fisher populations. Predation, mainly by bobcats and mountain lions, but also known to occur by coyote, has been identified as the cause of death for roughly 60% of fishers necropsied to date. Canine distemper virus and anticoagulant exposure have directly caused fisher mortalities; but these and other pathogens or toxins, including an unidentified apicomplexan parasite and a trematode, may also affect fisher populations through illness, impaired reproduction, or increased vulnerability to predation. It is likely that disease and predation, alone or combined, have population level impacts on fisher populations. These effects are most likely to be evident in the Southern Sierra fisher population which, due to its small size, is most vulnerable to stochastic events like a disease outbreak, or to sub-lethal impacts of disease. Future approaches that could be used to further assess the impact of disease and predation include investigations of immunogenetic variation, incorporation of disease and predation rates into population viability models, and ecological and risk factor analyses investigating links between pathogens, toxins and predation. Additionally, potential management actions, including vaccination or habitat alteration to reduce predation or the indirect effects of competing predators on fisher, could be implemented and rigorously evaluated to determine if these changes improve fisher population growth or increase range expansion. Approaches and lessons learned from other species, including sea otters (*Enhydra lutra*) and island foxes (*Urocyon littoralis*), that may be applicable to fishers will be discussed. These approaches and management options must rely on continued fisher population disease monitoring, and include determination of causes of mortality through necropsy, forensic analysis of predation, and disease/toxin exposure assessments.