

FIA-FSP funding for research on Spotted Owls and Mountain Caribou

In the wake of recent government announcements regarding Mountain Caribou and Spotted Owls, it is interesting to have a look at provincial research investments to inform decision-making about the recovery of these species. The Forest Investment Account – Forest Science Program (FIA-FSP) has been providing financial support for research on species-at-risk, with a particular emphasis on Northern Spotted Owls (*Strix occidentalis caurina*) and Mountain Caribou (*Rangifer tarandus caribou*). A few of these research projects are highlighted below.

Land management for Spotted Owl habitat

In southwestern British Columbia, maintaining sufficient habitat for the endangered Northern Spotted Owl is one of several factors considered in forest management planning. As with most species that use habitat on a landscape scale, identifying forest stands containing attributes of Spotted Owl (SPOW) habitat has been less problematic than figuring out the best spatial arrangement of this habitat over broader scales.

Over the last several years, FIA-FSP has provided funding for scientists from the Ministry of Forests and Range, Cortex Consultants Inc., Gowlland Technologies Ltd. and the Canadian Spotted Owl Recovery Team (CSORT) to develop an innovative modelling framework that provides information on habitat supply and the corresponding response of the SPOW population under different landscape management options. The modelling framework integrates five spatially explicit model components: a spatial timber supply and landscape dynamics model, a SPOW habitat classification model, a spatial model for calculating locations and sizes of potential SPOW territories, a SPOW population model, and a structural connectivity model for assessing the connectedness of SPOW habitat. The framework can also be used to explore the impacts of other threats identified in the CSORT Recovery Strategy, such as competition from the Barred Owl and climate change on SPOW habitat and populations. A full report about the model is available at <http://www.for.gov.bc.ca/hfd/pubs/Docs/Tr/Tr038.htm>.

The potential threat of Barred Owl competition provides a good example of how the model can be used. Biologically similar to the Spotted Owl, the Barred Owl is an eastern invader whose generalist use of habitat and prey makes it a potentially serious threat to Spotted Owl recovery. Little is currently known about how Barred Owls interact with Spotted Owls in British Columbia, but published evidence from adjacent US states indicates that the presence of the more aggressive Barred Owl can negatively affect various aspects of the SPOW's life history, including reproductive success, the ability for juveniles to disperse, and territory establishment. Scientists with the B.C. provincial government and CSORT felt it was important to understand the potential threat of Barred Owls for limiting SPOW recovery despite other management actions. Led by Louise Waterhouse with the BC Ministry of Forests and Range and Dr. Glenn Sutherland with Cortex, the research team has been studying and integrating the impacts of Barred Owl competition on Northern Spotted Owl population recovery within the modelling framework. Results so far show that, under assumptions used in the model, Spotted Owls are vulnerable to Barred Owl competition for nesting and foraging areas, and they may also be vulnerable if the presence of Barred Owls interferes with dispersing Spotted Owl juveniles. While a peer-reviewed

publication resulting from this FIA-FSP funded research is being finalized, verifying the model assumptions and testing to understand the relationship between the two species remains an important research need. Still, the results lend credence to the idea that land management decisions about Spotted Owl recovery need to address the corresponding interactions with Barred Owls.

Maintaining Mountain Caribou Habitat – the complicated interrelationship between habitat fragmentation and predation

The conservation status of Mountain Caribou, an endangered ecotype of Woodland Caribou whose specialization on snowy, mountainous terrain makes them globally unique, is also critical in British Columbia. Mountain Caribou are currently distributed within seventeen isolated subpopulations, nine of which hold less than twenty individuals. The decline of this old-growth-dependent species has been largely associated with landscape changes resulting from natural fires and forest harvesting, so considerable research effort has invested in studying how to maintain caribou habitat while still extracting some timber value from these areas. Understanding the habitat needs of caribou at the stand level – specifically, how to increase or maintain forage for this species – has been relatively simple. Caribou feed almost exclusively on one shrub (*Paxistima myrsinites*) and 2 genera of arboreal lichen (*Alectoria* and *Bryoria*) during the winter and various partial harvesting techniques have been shown to successfully maintain these forage species. However, research has shown that caribou populations tend to start decreasing before forage becomes limited; this suggests that something else is driving the population down. Enter habitat fragmentation, which seems to have a complex interaction with predator-prey relationships in these mountain ecosystems. The theory is that forest harvesting supports an increase in other ungulates such as deer and moose, which in turn leads to increases in predator populations. Because caribou are relatively easy to kill once encountered, increasing predator numbers means increasing predation on caribou.

Supported with funding from the FIA-FSP and other sources, Dr. Bruce McLellan (BC Ministry of Forests and Range) and his research team have spent the past several years studying the impacts of habitat fragmentation on caribou movements, habitat selection, and the predator-prey system, with the goal of understanding how the landscape pattern of forest harvesting can be improved to better support Mountain Caribou populations. Since caribou often need to pass through young, densely stocked stands – areas that caribou actively avoid – to access remnant areas of old growth, McLellan's research is also investigating approaches to make these young stands more permeable to caribou. The results have shown how important it is to manage ecosystems as a whole, rather than focusing on a single aspect such as forage. In addition to appearing in several peer-reviewed publications, results from this research have had profound impacts on land use planning processes over the large areas of the province that are home to caribou, guiding everything from old forest retention to the location of recreation tenures.

The Forest Investment Account's Forest Science Program (FIA-FSP) funds applied research and the extension of forest science results to meet the information needs and priorities of those who plan and manage British Columbia's public forest lands. Annual research investment priorities are guided by a 14-member Forest Science Board and several advisory committees comprised of foresters, biologists, and

scientists from industry, government, universities, and First Nations, as well as extension professionals. Research on species-at-risk has been highlighted as a priority topic for investment since 2005. To date, FIA-FSP has funded 27 projects classified as species-at-risk research for a total investment of over\$3.4 million. For more information on the research program, see www.fia-fsp.ca. Completed project reports are found at <http://www.for.gov.bc.ca/hcp/fia/searchreports.htm>.