

North American Lynx

(*Lynx canadensis*)

State Status: Threatened, 1993

Federal Status: Threatened, 2000

Recovery Plans: State, 2001

Lynx are slightly larger than bobcats and smaller than cougars. Features that distinguish them from bobcats include longer legs, larger paws, fuller facial ruff, longer ear tufts (Figure 1), and a blunt, black-tipped tail. Adults average 19-22 lb, with males being slightly larger and heavier than females.

Lynx inhabit the northern forests of North America. In Washington, lynx are found in high-elevation forests of northeastern Washington in Okanogan, Chelan, Ferry, Stevens, and Pend Oreille counties. A breeding population also occurred historically in the southern Cascades near Mount Adams.



Figure 1. Female lynx captured in Okanogan County in 2012 (photo by Jeff Heinlen).

Lynx are adapted to cold temperatures and deep snows of boreal forest. In Washington, this generally includes conifer forests above 4,000 ft, such as lodgepole pine or Engelmann spruce-subalpine fir forests, and rarely dry lowland forests. Optimal lynx foraging habitat is vegetated with dense young stands of lodgepole pine that support high numbers of snowshoe hares.

Lynx were trapped in Washington until 1991. Their numbers dwindled in the 1970s when old burns that had provided the best habitat became mature, and snowmobiles and new roads gave trappers greater access. Today, lynx persist in small numbers in Okanogan County and occur intermittently in the other northeastern Washington counties. The most important factors affecting lynx in Washington are fire history and suppression, forest management, and insect epidemics. Forest management and lynx harvest in British Columbia also adversely affect Washington lynx and dispersal of lynx into Washington. Ripple et al. (2011) hypothesized that the decline of lynx and low densities of snowshoe hares in the coterminous U.S. are at least partly the result of the extirpation of wolves. The elimination of wolves resulted in higher populations of coyotes that prey on hares, and higher populations of deer and elk that compete with hares for browse. Ripple et al. (2011) suggested that the hypothesis be tested, and that wolf restoration and management should consider these kinds of interactions.

Lynx are largely dependent on a single prey species, the snowshoe hare, but they also eat red squirrels, small mammals, and birds (Aubry et al. 2000). In northern boreal forests, lynx undergo cyclical changes in abundance that lag 1 year behind the 10-year snowshoe hare population cycle. Starvation is a common cause of death, especially during snowshoe hare declines, but lynx are also killed by other predators, including cougars and wolves. About 85% of the lynx habitat in Washington is in national forests, with the remainder on state and private lands. Goals of lynx habitat management are to maintain a mosaic of seral stages over time, with a portion of the landscape in young regenerating stands with high stem densities of saplings that support high numbers of snowshoe hares. The U. S. Forest Service, Washington Department of Natural Resources, and two private timber companies each have habitat management plans that attempt to balance the needs of lynx within the economic constraints of timber management (Ruedigger et al. 2000, Gilbert 2006, Roloff 2007). WDFW completed a state recovery plan in 2001

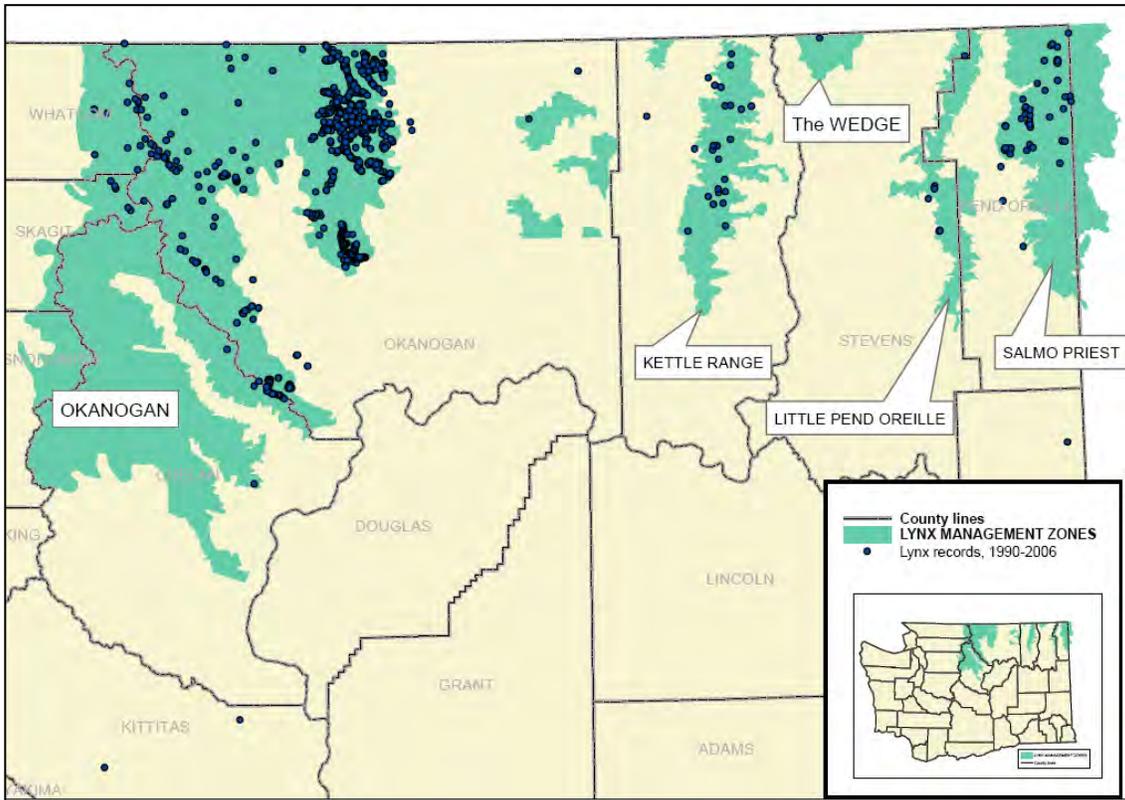


Figure 2. Lynx records and management zones in Washington (from Stinson 2001).

(Stinson 2001). It identified Lynx Management Zones for Washington based on lynx occurrence records and vegetation work done by the U.S. Forest Service (Figure 2).

Climate change and large fires. The dependence of lynx on winter snow and boreal forest makes the species vulnerable to the insect epidemics and fires associated with climate change. The short-term prospects of maintaining lynx in Washington have been made more difficult by recent fires in the core of their range. Since 1985, half of the 2,411 km² of suitable habitat for lynx in Chelan and Okanogan counties has burned. The 2006 Tripod Fire burned 600 km² of what was considered the best and most extensive lynx habitat in Washington (Figure 4; Stinson 2001, Koehler et al. 2008). Widespread tree mortality from mountain pine beetle (*Dendroctonus ponderosae*) has been worsened by mild winters that increase winter survival of the beetles (Raffa et al. 2008) and threatens to increase the incidence of large high intensity wildfires.

Habitat analyses suggest that lynx require at least four months of continuous winter snow cover (Gonzales et al. 2007). Under future climate scenarios, suitable habitat for lynx may shift northward as much as 200 km by the year 2100. Thus, Washington could lose much of its lynx habitat in the

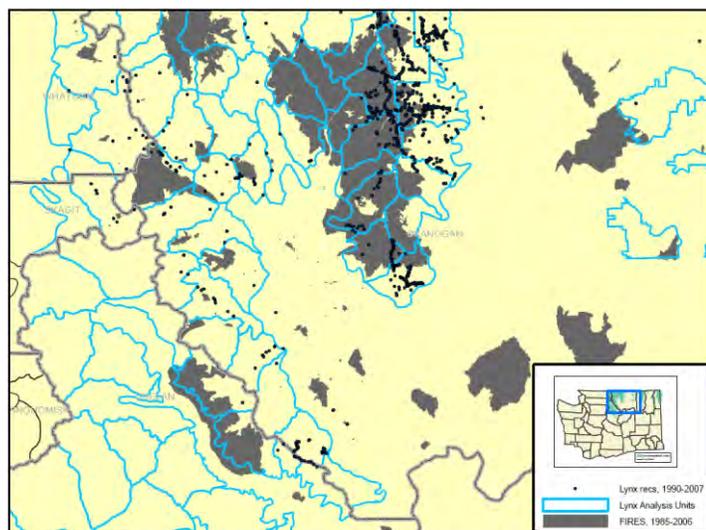


Figure 4. Recent fires, lynx detections, and Lynx Analysis Units in the Okanogan region of Washington.



Figure 5. Male lynx captured (left) and being released (right) in Okanogan County, 2012.

long-term (Gonzales et al. 2007).

Land conservation. In 2011, WDFW acquired two groups of properties that may benefit lynx. These included 3,075 acres in the Okanogan-Similkameen watershed and 1,418 acres in the Methow watershed.

Monitoring and research. Lynx Management Zones were regularly surveyed for lynx presence by WDFW and volunteers from partner organizations from 1990-2008, except where winter access was extraordinarily difficult. Snow-tracking surveys documented lynx intermittently in northeastern Washington, except in western Okanogan County, where kitten tracks were consistently observed each winter. Maletzke et al. (2008) snow-tracked lynx during 2002-2004 and found increased hunting behavior in Englemann spruce and subalpine fir forests, where densities of snowshoe hares were relatively high. Koehler et al. (2008) used snow-tracking data to develop a model of lynx-habitat relationships that could be used to assess the potential distribution of lynx in Washington. They estimated about 3,800 km² of suitable habitat, indicating that Washington could support up to 87 lynx, but they believed this was an overestimate because it was based on an area where hare densities were high.

In 2006, the WDFW, Washington Department of Natural Resources, U.S. Forest Service, U.S. Bureau of Land Management, and U.S. Fish and Wildlife Service initiated research to: 1) assess the status of lynx populations in Okanogan County, 2) identify landscape and habitat parameters used seasonally by lynx, 3) assess whether vegetation management prescriptions for lynx habitat implemented by the U.S. Forest Service and Washington Department of Natural Resources were adequate to maintain or improve lynx habitat and lynx populations, and 4) provide recommendations, if needed, to assure the persistence of a viable lynx population in Washington. From January 2007 to December 2010, 11 males and one female were captured and marked with ear tags and with VHF/GPS collars, with >10,000 GPS coordinates recorded from these animals (Koehler et al. 2011). An additional four new lynx were captured and marked during 2011. Additional past research has focused on lynx habitat use and snowshoe hares in Washington, in part to improve understanding of lynx habitat needs and how timber management can better accommodate those needs (Interagency Lynx Committee 1999, von Kienast 2003, Gilbert 2005, Walker 2005, Poelstra 2007).

A pilot study conducted in 2010 assessed the effectiveness of using dogs to find lynx scats from which DNA profiles can be obtained to determine the number of individual lynx present in an area. During the study, 10 of the 14 scats collected were identified as being from lynx.

In 2010, a University of Washington PhD student began research on snowshoe hares in Loomis State Forest and Okanogan National Forest. From 2010-2013, 364 hares were captured, and radio collars deployed 238 times during 27 months of field work. Data from predation events were collected, and DNA from saliva, hair, and observations were collected to identify the predators.

In 2012, two females and two male lynx were captured in a study area in the Methow Valley Ranger District of Okanogan-Wenatchee National Forest and fitted with new GPS collars that record their movements which can be downloaded for analysis. One of the males had originally been captured in 2011, but his collar had failed. The carcass of another male collared in March 2011 was found in shrub-steppe east of the Scotch Creek Wildlife Area. The collar was intact and data on its movements were downloaded. WDFW and USFS staff radio-tracked and successfully downloaded GPS location data from 3 of 4 lynx collared in 2011. Two graduate projects are using the accumulated data from lynx locations. A Washington State University Master's student is analyzing data from 9 lynx in a study of seasonal habitat use. A second Master's project involves a student from University British Columbia-Okanogan using the data to look at habitat connectivity, and is expected to generate maps of core and corridor habitat based on lynx movements.

Partners and cooperators: Washington Department of Natural Resources, U.S. Forest Service, U.S. Fish and Wildlife Service, Seattle City Light, University of British Columbia-Okanagan, Oregon Zoo, Washington State University, University of Washington, Conservation Northwest, University of Montana, Central Washington University, Forest Capitol Partners, Stimson Lumber Company.

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Figure 6. Lynx tracks (right) and high elevation habitat in Okanogan County (photos by S. Fitkin).