

Northwest Science Notes

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John R. Squires¹, United States Forest Service, Rocky Mountain Research Station, Box 8089, Missoula, Montana 59807

and

Robert Oakleaf, Wyoming Game and Fish Department, 260 Buena Vista, Lander, Wyoming 82520

Movements of a Male Canada Lynx Crossing the Greater Yellowstone Area, Including Highways

Abstract

From 1999–2001, a male Canada lynx engaged in yearly exploratory movements across the greater Yellowstone area including the Teton Wilderness Area and Yellowstone National Park. For three consecutive summers, the lynx traversed a similar path in a northwesterly direction from the animal's home range in the Wyoming Range near Big Piney, Wyoming, to as far as the Henry's Lake Mountains, west of West Yellowstone, Montana. The longest travel distance was a minimum of 728 km during the summer of 2001. The male crossed several two-lane highways during his movements, including one highway that was crossed at least four times using the same general corridor between the Wyoming and Wind River Mountain Ranges.

Introduction

Canada lynx (*Lynx canadensis*) in the contiguous U. S. reside in small, widely distributed patches of boreal and western montane forests (Aubry et al. 2000, McKelvey et al. 2000). Small and geographically distinct populations are susceptible to demographic risks and stochastic environmental perturbations (Shaffer 1981, Gilpin and Soulé 1986). This may be especially true for lynx at the southern extent of the species' range as the patchiness of moist boreal forests increases (Agee 2000, Aubry et al. 2000, McKelvey et al. 2000). Given the distribution of lynx in the contiguous U.S., we assume that persistent populations at the southern extent of the species' range, such as the animals in Wyoming and Montana, depend on the movements of individuals across large geographic areas for demographic and genetic

rescue (Levins 1969, MacArthur and Wilson 1967). Therefore, improving our understanding of broad-scale movements has important conservation implications. In this note, we discuss the exploratory movements of 2 lynx within the greater Yellowstone area (GYA).

Methods

During the winter of 1996–1997, biologists from the Wyoming Game and Fish Department radio-collared two lynx (1 male, 1 female) in the Wyoming Range, near Big Piney, Wyoming. The Wyoming Range appeared to support a persistent lynx population as evidenced by harvest records from the 1970s and track observations throughout the 1990s. These animals were originally collared to increase our general understanding of lynx habitat use in GYA and to help biologists locate others individuals in the region. In October 2000, we replaced the male's VHF collar with a satellite

¹Author to whom correspondence should be addressed. E-mail: jsquires@fs.fed.us

transmitter (*Service ARGOS*, Inc.TM) to calculate locations. The satellite collar was programmed to obtain a location every other day, and the animal's movement path was delineated by plotting the best quality location for each day. Although the specific accuracy of ARGOS relocations was unknown, we believe that most locations were within 1 km (Keating et al. 1991).

Travel Routes

In 1998, we lost contact with the male on 5 June and he was not relocated until 4 September when he returned to his previous home range in the Wyoming Range. We also lost contact with the female until 10 August when she too returned to the Wyoming Range. We used aircraft to search for both animals in the Wyoming Range, but we did not expand our efforts to include the broader GYA. Thus, we concluded that both individuals engaged in exploratory movements outside their usual home ranges during 1998, but the extent of these movements was unknown. The female remained in the Wyoming Range until she died in March 2000.

In 1999, the male crossed State Highway 189/191, a two-lane highway, approximately 16 km east of Bondurant, Wyoming, between 7–11 May (Figures 1, 2) as he traveled north about 40 km to the Wind River mountain range. Between 13–24 June, he returned to his core home range in the Wyoming Range crossing state Highway 189/191 in the same general area as he did in May (Figure 2). Between 24 June and 1 July, the male crossed Highway 189/191 a third time as he traveled approximately 80 km north into the Wind River Range, before returning to his home range between 5–11 August. We could not document the location of the highway crossing on his return trip, but we assume it was in same area as previous crossings based on the last relocation. The sum of straight-line distances between relocation points that defined the 1999 movement from 6 May–5 August was 194 km.

During the summers of 2000 and 2001, the male made two "exploratory" movements that were similar each year. The two movements generally extended from the male's home range in the Wyoming Range to the Idaho/Montana border, as he traversed the Wind River Mountain Range, the Teton Wilderness Area, and Yellowstone National Park (Figure 1). In April 2000, the male first trav-

eled 95 km south before returning to his home range. He then left his home range on 18 June as he traveled in a northwesterly direction as far as Island Park, Idaho. On 1 August, he began the south leg of his journey back to his home range in the Wyoming Range following the same general route he used during early summer. The minimum straight-line distance between relocation points from late June through mid-September, 2000, was 421 km.

During summer 2001, the male left his home range on 21 May as he traveled to the Henry's Lake Mountains near West Yellowstone, Montana, following the same general route he did the previous year (Figure 1). Near West Yellowstone, the male crossed State Highway 20 near Macks Inn, Idaho, before continuing in a northwest direction to the Henry's Lake Mountains where he remained for approximately one week. On 8 August, he began his return trip to the Wyoming Range following the same general path he used in previous years. The minimum straight-line distance from 25 May–29 September 2001 was 728 km. The male died in January 2002.

Corridors and Movement Pattern

From 1999–2001, the male appeared to use the same Bondurant "corridor" when traveling to the Wind River Range from the Wyoming Range in the spring/early summer and when returning in the fall. During 2000 and 2001, the male also appeared to cross State Highway 287 on Togwotee Pass in the same general area (Figure 2). However, the precise location where the male crossed highways could not be determined given the crudely defined movement path as delineated by aerial and ARGOS-based satellite telemetry. The male's general movement pattern was characterized by periods of steady movement punctuated by times when he remained in the same area for several days. For example, the male traveled to Heart Lake in Yellowstone National Park on 19 August, 2000, and remained in the same general area until 27 August before he continued across Yellowstone National Park. In 2001, the male centralized his movements near Togwotee Pass from 6–14 June before heading north into the Absaroka Range. He then localized in an area approximately 30 km south of Yellowstone Lake from 27 June–10 July before traveling across the southern portion of Yellowstone National Park to Heart Lake that he had visited the previous summer.

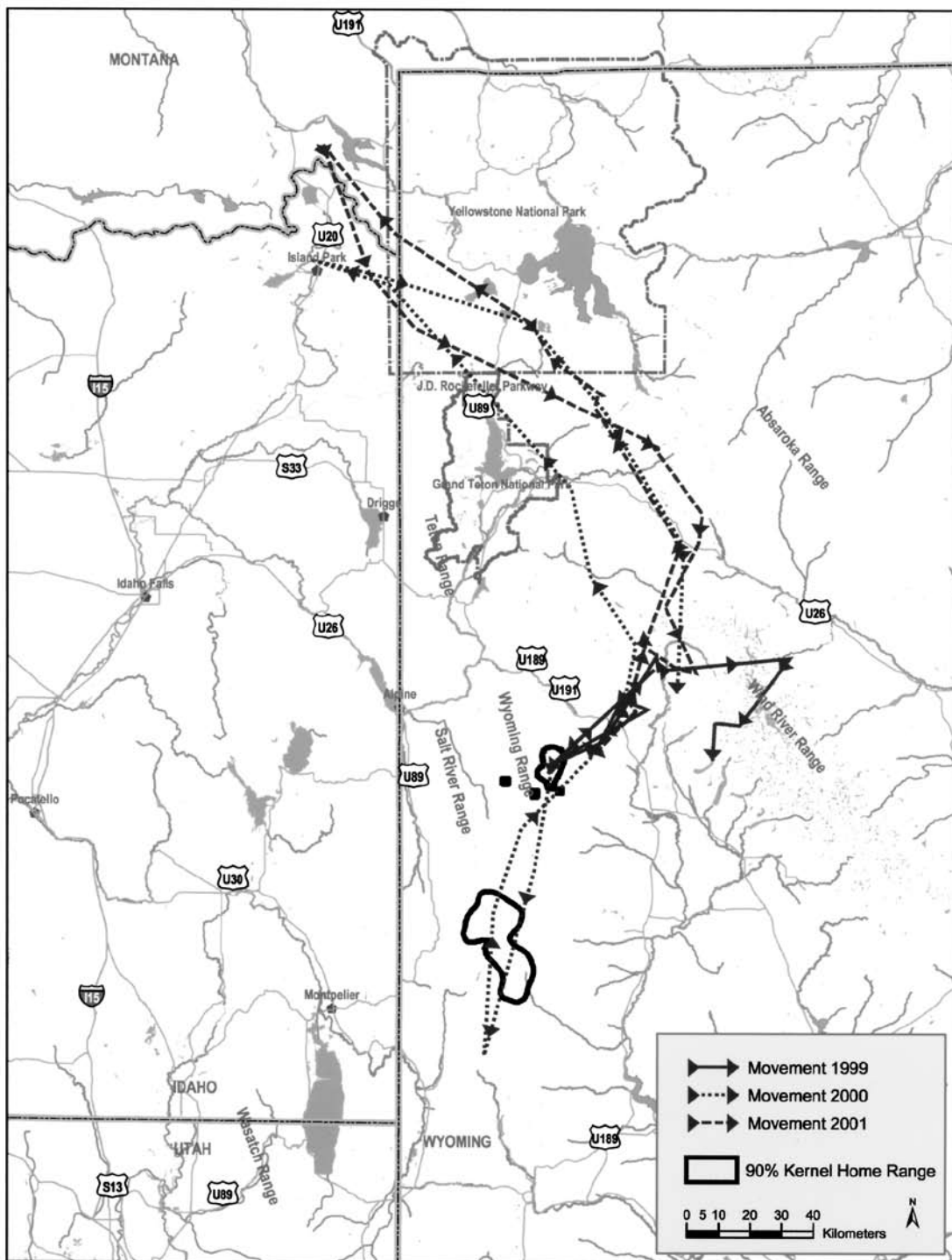


Figure 1. Exploratory movements of a male lynx in the Greater Yellowstone area during the summers of 1999–2001.

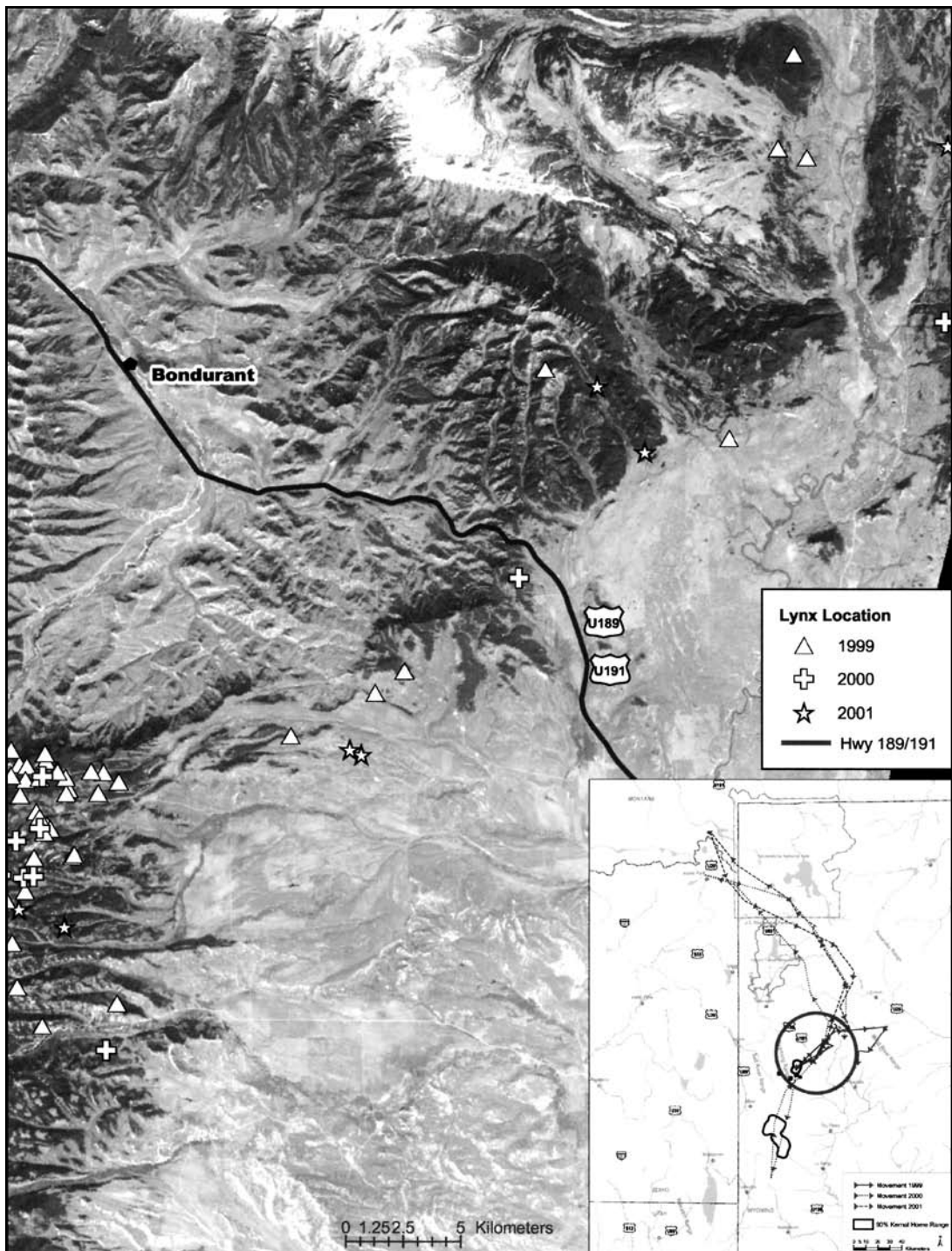


Figure 2. A “corridor” near Bondurant, Wyoming, used repeatedly by a male lynx as he traveled between the Wyoming and Wind River mountain ranges.

Discussion

It is well documented that lynx are capable of long-range exploratory movements, some over a 1000 km (Mech 1977, Brainerd 1985, Brittell et al. 1989, Slough and Mowat 1996, Squires and Laurion 2000, Mowat et al. 2000). However, the Wyoming male's movements were unique because he followed the same general movement path during consecutive summers. We can only speculate regarding the reason for his long-range movements. The Wyoming male did not begin these movements until late spring, well past the February-through-March breeding season. Although breeding was not a possibility, the male may have used these movements to assess the distribution of females throughout the region. It is also possible that he left his winter home range in response to a food shortage. For example, lynx from northern populations became nomadic when food availability was low (Ward and Krebs 1985, Slough and Mowat 1996). However, this explanation seems unlikely given the seasonal abundance of potential prey such as ground squirrels and snowshoe hare (*Lepus americanus*) leverets that appeared abundant on the study area during summer.

The male's exploratory movements during the summer were not random wanderings; rather, he appeared to "pilot" a route that included the same corridors and stop-over areas used in previous years. For example, the lynx used the same Bondurant corridor on at least four occasions to cross the two-lane highway (State Highway 189/191) that separated the Wyoming Range from the Wind River Mountain Range. This corridor consisted of small

islands of lodgepole pine *Pinus contorta* within a sagebrush *Artemisia* spp./wheatgrass *Agropyron* spp. matrix. We speculate the animal may have traveled from island to island as he crossed the Bondurant corridor, but our location data lacked the necessary precision to test this notion. The corridor used by the Wyoming male to cross the two-lane highways on Togwotee Pass and near Mack's Inn, Idaho had more contiguous forested cover compared to that near Bondurant.

We recognize that anecdotal observations of corridor use by a single individual have limited utility. However, these observations do illustrate the importance of gaining empirically-derived understandings of how lynx respond to landscape pattern, including highways and putative corridors. These understandings are especially important for lynx in the contiguous United States where habitat connectivity could be a major factor in the long-term persistence of geographically distinct populations.

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