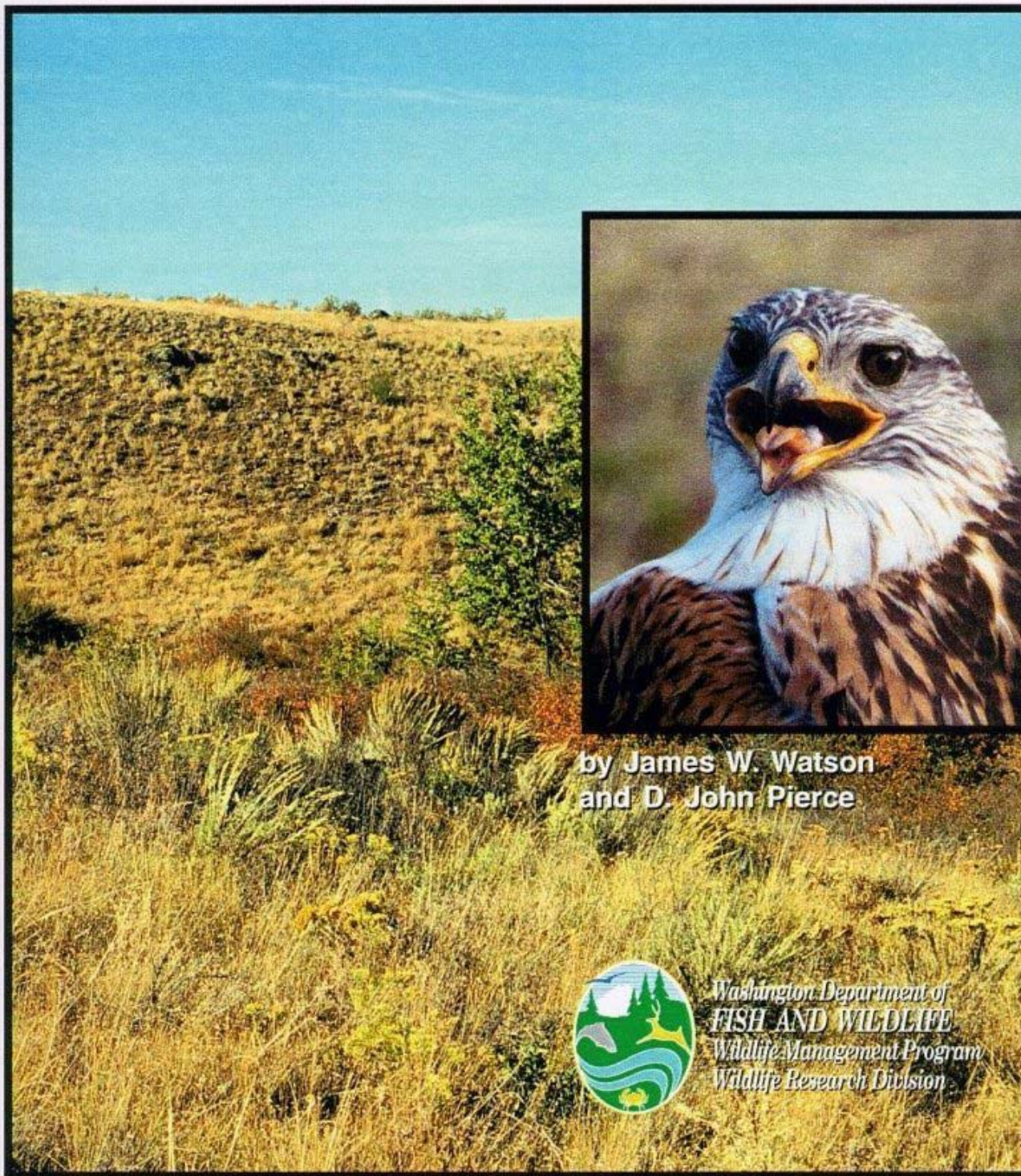


Migration and Winter Ranges of Ferruginous Hawks From Washington



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MIGRATION AND WINTER RANGES OF FERRUGINOUS HAWKS
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Abstract:

*From 1999–01 we studied the migration and winter ranges of ferruginous hawks (*Buteo regalis*) that breed in Washington state. We attached satellite PTT's (platform transmitter terminals) to 12 adult and 6 nestlings to monitor their long-range movements. Preliminary results from 7,120 locations showed most hawks migrated to the eastern front of the Rocky Mountains or the northern plains in the fall, and wintered in central or southern California. Ground reconnaissance at fall sites where adult hawks remained 4 to 10 weeks found hawks primarily associated with populations of Richardson's ground squirrels (*Spermophilus richardsoni*) and pocket gophers (*Thomomys* spp.) in native prairie habitats or on edges of cultivated land. Three of 9 adult hawks (30%) were confirmed or suspected mortalities during the winter of 2000. In 2001 we deployed 4 PTTs on juvenile hawks to better understand their movements and survival. We plan to continue deployment of PTTs on juvenile hawks in 2002.*

INTRODUCTION

The ferruginous hawk (*Buteo regalis*) is a state Threatened Species in Washington. In the Columbia Basin the loss of shrubsteppe habitat through agricultural conversion has reduced nesting sites and associated prey important to ferruginous hawks. The importance of winter ecology of the species to this population decline is unknown. In particular, winter movements, winter range philopatry, and prey relationships of ferruginous hawks from Washington are little studied.

In spring, 1999, we initiated an investigation of ferruginous hawk ecology in eastern Washington (Watson and Pierce 2000). We report here on the progress of the study through July, 2001. Our specific objectives were to: 1) describe ferruginous hawk migration corridors and timing; 2) identify their winter ranges and key prey; and 3) identify their sources of winter mortality. The emphasis of the study in 1999–00 was on adult hawk ecology, and in 2001 we targeted juvenile hawks for study.

METHODS AND STUDY AREA

In each spring of 1999–01 we surveyed ferruginous hawk nesting territories primarily in Benton and Franklin counties and targeted active sites for capture of adults or juveniles. Adults were captured with *dho-gaza* nets and great horned owl (*Bubo virginianus*), or bal-chatris and live mice. Nestlings were captured on the ground post-fledging or taken from accessible nests just prior to fledging. Captured hawks were weighed, banded with USFWS tarsal bands, and measured (i.e., wing chord, wingspread, hallux length, beak depth, and foot pad). Hawks were outfitted with 20, 30, or 35-g platform transmitter terminals (PTTs). PTTs were pre-programmed to transmit at different duty cycles, including 1 broadcast every 4 days over 1 year, every 8 days for 2 years, and every day for 3 years. PTTs were attached with "X-attachment" backpacks

(Buehler et al. 1995) using 7-mm wide teflon ribbon. Hawks were released at capture locations <1 hr following their capture. Additional details of capture and monitoring methods are provided in Watson and Pierce (2000).

In August of 1999 and 2000, after hawks migrated from territories, we initiated ground visits to Canadian Provinces and states in the northern and central plains, and contacted local biologists to obtain information on potential prey, habitat, and known ferruginous hawk use of the area where telemetered hawks became localized. For most hawks, biologists were able to make ground visits to search for the hawk, photograph the site, and assess habitat and prey. Searches were also made for dead hawks when mortality was suspected to assess cause of death and recover PTTs. Hawk mortality was suspected when the activity counters on PTTs remained the same over several transmissions (e.g., >2 weeks). Temperature readings (recalibrated to actual temperatures from ARGOS coding) provided a further indication that PTTs were stationary; PTTs on living birds had temperatures between 10°C and 35 °C, but typically dropped to below 10 °C and assumed ambient temperatures when they were stationary.

RESULTS

PTT Deployment and Hawk Status

As of July, 2001, 7,120 satellite locations had been received from 12 adult and 6 juvenile ferruginous hawks captured and fitted with PTTs from 1999–01 (Table 1). Five hawks were monitored for at least 2 years. During the 3 years there was one confirmed mortality, and 3 others were suspected, including 1 juvenile. Signals lost on 2 other hawks may have resulted from PTT failure. All confirmed or suspected mortalities occurred after hawks migrated from the breeding area. However, adult female 15216 disappeared abruptly from her breeding territory in June, 2000, just prior to the fledging of 3 young, which died in the nest. Although 2 weak signals were received after her disappearance that indicated the PTT was moving, we suspect she also died. We recaptured hawk 15184 in spring, 2001, and recovered her PTT. There were no signs of feather wear or abrasion from carrying the harness and PTT 2 years.

Fall and Winter Ranges

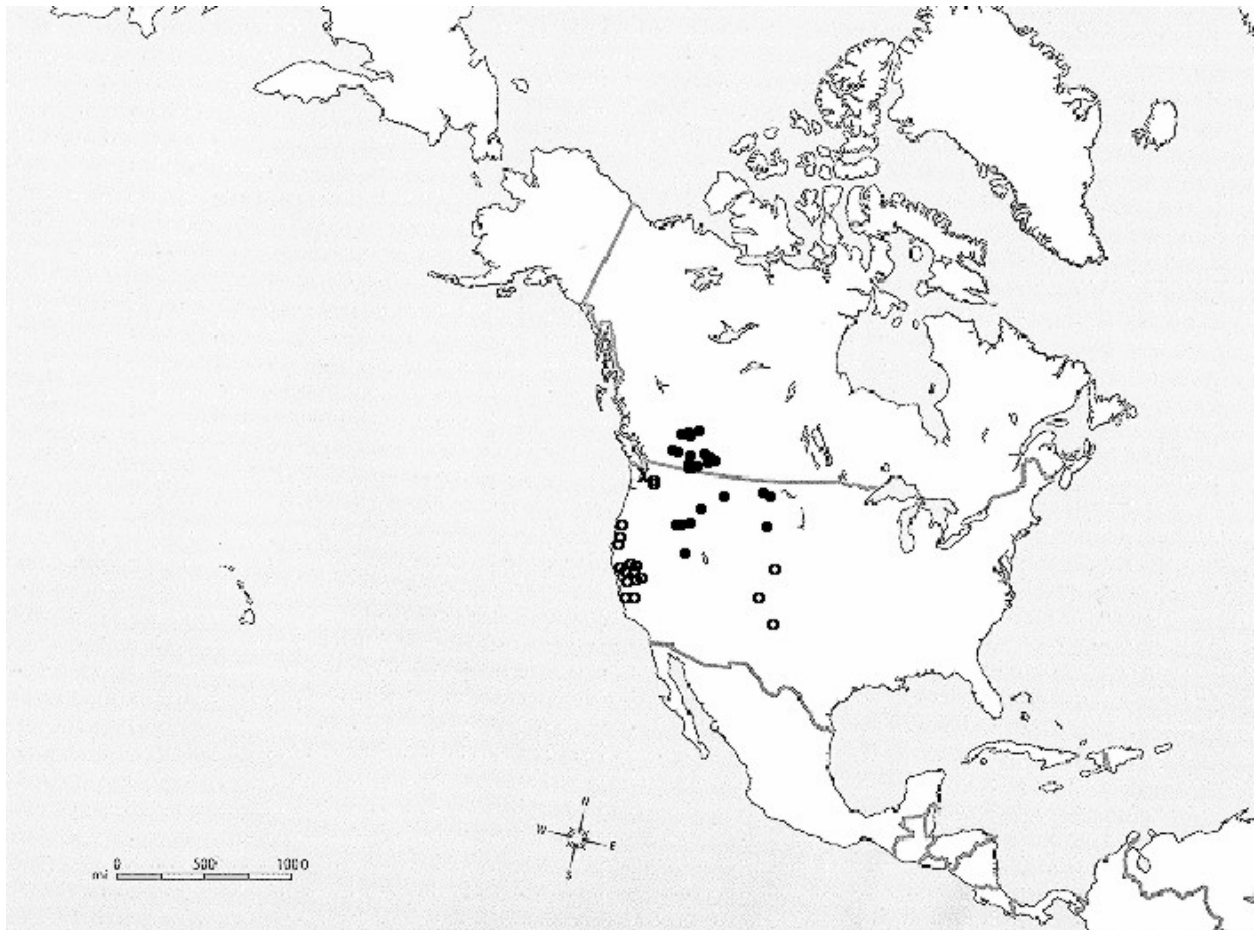
Hawks exhibited 2 major movements after the breeding season to 2 major regions (Fig. 1). Fall migration for all but 2 hawks was west or northwest over the Continental Divide to locations along the Rocky Mountain front or northern plains. Sixty-seven percent of fall locations ($n = 24$) were in northern Montana or Canadian provinces. Three hawks spent the fall in southern Idaho

Table 1. Status of ferruginous hawks captured on breeding territories in eastern Washington from 1999–01.

Territory	WDFW occ. no. ^a	Age/ Sex	PTT ID	Band no.	Dates monitored	No. locations	Status ^b
Route 2273	adM	15226	877-62665		5/27/99–10/19/00	672	2
WPPSS	132	adF	15227	1207-25044	5/29/99–6/4/00	497	3
Webber Can.	301	adF	15185	608-41259	5/30/99–11/26/99	253	4
May Junction	184	adF	15184	1207-35127	6/2/99–6/5/01	331	2
Beck 1	285	adF	15216	608-41260	6/3/99–2/3/01	450	5
FFTFN	135	adM	15218	877-62667	6/4/99–11/17/00	711	2
Chandler B.	64	adM	15217	877-62668	6/7/99–10/12/99	316	3
Sulfur Lake E.	194	adM	15186	877-62669	6/12/99–2/12/01	650	2
Kahlotus W.	129	adM	15228	877-62670	6/14/99–8/4/01	592	1
Webber Can.	301	juF	10372	608-41265	6/14/99–07/28/01	354	1
WPPSS	132	adM	15185r	877-62672	5/26/00–3/8/01	125	5
FFTF Jeep	188	adF	16652	608-41266	5/30/00–12/7/00	663	5
Pipeline E.	162	adM	10394	877-62673	6/2/00–7/16/01	1011	2
Pipeline E.	162	juM	10379	877-62674	6/22/00–5/27/01	157	3
Horn Rapids	185	juF	15226r	608-41213	6/19/01–8/12/01	171	1
Dune	199	juF	15186r	608-41214	6/19/01–7/14/01	40	1
WPPSS	132	juF	15227r	608-41215	7/2/01–8/10/01	179	1
May Junction	184	juF	15218r	608-41217	7/16/01–8/12/01	32	1

^a Washington Department of Fish and Wildlife Heritage Data Base Occurrence Number.

^b 1 = PTT active; 2 = PTT expired, hawk alive; 3 = PTT expired prematurely and stationary, suspected mortality; 4 = confirmed mortality; 5 = PTT expired prematurely but hawk active at last transmission.



- x Capture location
- Fall locations (August through October)
- Winter locations (November through February)

Figure 1. Fall locations ($n = 24$) and winter locations ($n = 17$) of 18 telemetered ferruginous hawks captured on breeding territories in southcentral Washington, 1999–01.

and northern Utah. Hawks migrated again in October; 76% of winter locations ($n = 17$) were in California. Three birds wintered in the central plains, and hawk 15186 returned to winter on his territory in Washington both years he was followed. Movement patterns of the other 4 adult hawks monitored 2 years were also to the same regions each visited the previous fall and winter. In fall, 2001, hawk 15128 made his third fall visit to the same region in the Cypress Hills of southern Alberta.

Field visits to fall ranges in 1999 and 2000 found ferruginous hawks located in native prairie habitats adjacent to cultivated land. Ferruginous hawks and prairie falcons (*Falco mexicanus*) were observed capturing Richardson's ground squirrels (*Spermophilus richardsoni*) which were abundant. In the northern and central plains locations (i.e., North Dakota, South Dakota, and Colorado) hawks were feeding primarily on pocket gophers (*Thomomys* spp.) along roadsides or on edges of cultivated land, even though black-tailed prairie dog colonies were located as close as 3 km from the centers of hawk ranges. Despite extensive searches, we were successful in locating and recovering only 1 PTT at suspected mortality sites.

DISCUSSION

Preliminary results from 2 years of monitoring identified the fall and winter migration patterns and ranges of adult ferruginous hawks from Washington. We anticipate collecting similar information for juvenile hawks during the next 2 years to investigate differences in movement patterns and survival between adults and juveniles, and better understand where and when juveniles are recruited into the breeding population. Our first years of monitoring have identified prey as the proximate cause of migration, with hawk movements not limited by major mountain ranges (Watson and Pierce 2000). Prey limitations resulting from widespread drought in eastern Washington, as well as extensive fires in the summer of 2000, appear to have reduced both nesting activity and success of ferruginous hawks on the study area (unpubl. data). Consequently, as we continue to investigate aspects of ferruginous hawk winter ecology, we suggest there should be a renewed emphasis on assessing the status and limiting factors of the breeding population of ferruginous hawks under study.

Telemetered hawks will continue to be monitored as they return to territories in spring, 2002. We hope to deploy at least 6 additional PTTs on juvenile hawks in 2002. Web pages featuring the study have been established (www.zoo.org and www.wa.gov/wdfw/wlm/research).

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LITERATURE CITED

- Buehler, D. A., J. D. Fraser, M. R. Fuller, L. S. McAllister, and J. K. D. Seeger. 1995. Captive and field-tested radiotransmitter attachments for bald eagles. *Journal of Field Ornithology* 66:173-320.
- Watson, J.W., and D.J. Pierce. 2000. Migration and winter ranges of ferruginous hawks from Washington. Progress Report. Washington Department of Fish and Wildlife, Olympia, Washington, USA.