

Fall 2001 migration and satellite-tracking of raptors from the Goshute Mountains, Nevada

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During Fall 2001, field biologists from HawkWatch International (HWI) completed the 19th consecutive season-long count of migrating raptors (1983–2001) and 22nd consecutive season of migration banding (1980–2001) in the Goshute Mountains of northeastern Nevada. This flight includes up to 18 species of diurnal birds of prey and constitutes one of the largest known concentrations of migratory raptors in the United States and Canada west of the Great Plains (Smith and Hoffman 2000). Annual counts currently average about 17,000 birds but may range as high as 25,000. Four species typically make up between 80–90% of the flight: Sharp-shinned Hawk (*Accipiter striatus*), Cooper's Hawk (*A. cooperii*), Red-tailed Hawk (*Buteo jamaicensis*), and American Kestrel (*Falco sparverius*).

The 100-km-long Goshute Mountains range runs north–south along the Utah–Nevada border. Migrating raptors often follow north–south "leading lines" to take advantage of lift created by winds being deflected upward along the ridges (Mueller and Berger 1967, Kerlinger 1989). Raptors moving south from the northwestern Rocky Mountain and northeastern Intermountain regions probably funnel around the desert to the west and concentrate along the Goshute Mountains. Band returns indicate that this Intermountain Flyway draws migrants from an area extending north through Nevada, western Utah, Idaho, eastern Washington and Oregon, and continuing west of the Continental Divide into interior Alaska (Hoffman et al. in press). The Goshute field site is situated near the southern end of the Goshute Mountains along the top of a narrow, rocky, sparsely forested ridge at 2,745 m elevation (40° 25.42' N, 114° 16.28' W). The field site is located about 40 km south of Wendover, Nevada, within the Goshute Wilderness Study Area administered by the Bureau of Land Management, Elko District.

From 15 August through 5 November 2001, two primary observers, assisted by various guest and substitute observers, spent 787.3 hours on 80 days recording 20,954 migrant raptors of 17 species at the Goshute site. The flight was composed of 60% accipiters, 21% buteos, 14% falcons, 2% vultures, and 1% each of eagles, harriers, and Ospreys (*Pandion haliaetus*). The proportions of eagles and harriers were significantly below average, whereas the proportion of Ospreys was significantly above average. The count of 29 Peregrine Falcons (*Falco peregrinus*) tied the record high for the site. But the real highlight of the season was the largest single-day count ever recorded at the site: 2,198 birds on 27 September! Included in this tally were 913 Cooper's Hawks (possibly the largest single-day count ever recorded for this species anywhere) and more than 1,000 Sharp-shinned Hawks.

Adjusted (to standardize the annual sampling period and adjust for variation in observer numbers) passage rates (migrants counted per 100 hours of observation) were significantly above average for 8 of 17 species seen this season (Turkey Vulture [*Cathartes aura*], Osprey, Sharp-shinned Hawk, Cooper's Hawk, Broad-winged Hawk [*B. platypterus*], Red-tailed Hawk, American Kestrel, and Peregrine Falcon), and were significantly below average for 4 species (Northern Goshawk [*A. gentilis*], Ferruginous Hawk [*B. regalis*], Bald Eagle [*Haliaeetus leucocephalus*], and Prairie Falcon [*F. mexicanus*]). Regression analyses of adjusted passage rates (1983–2001) indicated at least marginally significant ($P \leq 0.10$) linear increasing trends for 12 of 16 species with sufficient data for analysis (HWI unpublished data). No distinct, long-term trends were evident for Golden Eagle (*Aquila chrysaetos*), Bald Eagle, and Northern Goshawk. Ferruginous Hawks showed a significant increasing trend between 1983 and 1991, high variability with no distinct trend through most of the 1990s, and a recent downturn. Similarly, Prairie Falcons showed a strong increasing pattern between 1985 and 1995, but since then have shown an equally strong decline, with the 2001 passage rate the lowest seen since 1987. More generally, although typically not sufficient to eliminate indications of long-term increasing trends, most species have shown distinct downward trends since 1997/98.

Indications of increasing trends for Turkey Vulture, Osprey, Broad-winged Hawk, Merlin, and Peregrine Falcon are consistent with evidence of generally widespread, long-term increases for these species (Sodhi et al. 1993, Henny and Kaiser 1995, Kirk and Mossman 1998, USDI Fish and Wildlife Service 1999, Smith et al. 2001). Otherwise, the Goshute site appears to be unique among HWI's 11 western project sites in showing increasing trends for so many species at least into the late 1990s. This may indicate that, compared to the central and eastern Rocky Mountains and Pacific Northwest, raptor productivity was particularly good in the northern Intermountain West and northwestern Rocky Mountains from the mid-1980s through about 1997/98. It now appears, however, that prolonged and widespread drought, including many wildfires, may have reversed that trend over the past three years. In fact, during Fall 2001, HWI and its partners recorded mostly below average total counts at migration sites throughout the western U.S. Most notably, counts of Northern Harriers, Northern Goshawks, and Ferruginous Hawks were down everywhere. Low goshawk counts matched reports of dismal breeding success in most areas, and low Ferruginous Hawk counts continue to focus conservation concern on this species (Bechard and Schmutz 1995).

During Fall 2001, HWI continued to expand its Western Migratory Raptor Satellite Telemetry Project to follow the movements of Red-tailed Hawks, Northern Goshawks, and Golden Eagles captured on migration in the Goshutes and at other HWI project sites in New Mexico and Washington. Three Red-tailed Hawks outfitted during fall 1999 in the Goshutes continued to transmit locations through at least early spring 2001. Over the 1.5–2.5 years that we tracked these birds, each showed high fidelity to specific winter ranges (Nayarit,

Chihuahua, and southern Baja California, Mexico), summer ranges (northwestern Montana, southeastern Idaho, and central British Columbia), and migratory pathways. The only exception is that during Fall 1999 the Idaho–Baja bird traveled west of the Great Salt Lake and Desert complex, whereas during the next two fall migrations it traveled east of Great Salt Lake (both spring migrations tracked to the west). During fall 2001, we outfitted four new Red-tailed Hawks in the Goshutes. Unfortunately, one bird died or shed its transmitter within the first week, but the other three are now wintering in south-central Durango, northern Baja California, and northern Sinaloa, Mexico. Thus far, all six red-tails tracked from the Goshutes into Mexico have stayed within expected bounds of the Intermountain Flyway (Hoffman et al. in press). However, despite more than 20 years of band-return data, the two satellite-tracked red-tails are the first records of Goshute migrants (any species) in Baja California!

In 2001, we continued to experience poor success tracking immature Northern Goshawks outfitted in the Goshutes. Both of the birds we outfitted this season either ceased transmitting altogether or apparently died after only 2–3 weeks. However, similar to the first five birds we outfitted, both appeared to be regional residents, having wandered northwest within Nevada after banding. Thus far, among the six goshawks that we tracked and subsequently recovered, two succumbed to predation (by a Great-horned Owl [*Bubo virginianus*] and Golden Eagle), one starved to death, and three died of unknown causes (all at least heavily scavenged). Our fourth Golden Eagle outfitted in the Goshutes also appears to be a regional resident. After banding, it wandered for a while and then settled for the winter in the Schell Creek Range near Ely. Two other satellite-tracked Goshute eagles wintered in south-central Utah and central Nevada, while a third wintered near Bakersfield, California.

We anticipate outfitting another 12 birds in the Goshutes during Fall 2002. Interested readers can review complete tracking summaries and maps for all birds outfitted to date on our web page (www.hawkwatch.org), and may obtain a complete technical report summarizing the results of the 2001 Goshute count and banding season by contacting the author in Salt Lake City (801-484-6758, jsmith@hawkwatch.org).

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