

FALL CONCENTRATIONS OF BUTEOS NEAR THE CONTINENTAL DIVIDE: A TWENTY-YEAR SUMMARY

ARNOLD T. GERSTELL AND CHARLES H. TROST

Department of Biological Sciences, Idaho State University, Pocatello, ID 83209 U.S.A.

ABSTRACT.—Since 1974, we have counted raptors at Henry's Lake, Idaho, just south of the continental divide. Counts were made in late summer and early fall. Three species, red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and Swainson's hawks (*Buteo swainsoni*) were the most plentiful. None of these hawks showed any strong increasing or decreasing trend in numbers over the 20-yr survey period, but all three showed a large increase in numbers subsequent to the end of a drought in 1977. We suggest that in some cases, a small number of counts may provide useful data, and that counts in different locations might provide information on migratory strategies of adults and juveniles.

KEY WORDS: *Buteo jamaicensis*; *Buteo regalis*; *Buteo swainsoni*; ferruginous hawk; migration; red-tailed hawk; Swainson's hawk.

Concentraciones de *Buteos* en otoño cerca de la división continental: un resumen de veinte 20 años

RESUMEN.—Desde 1974 hemos contado rapaces en Henry's Lake, Idaho, al sur de la división continental. Los conteos fueron hechos hacia el final de verano y a principios de otoño. Tres especies, *Buteo jamaicensis*, *Buteo regalis* y *Buteo swainsoni* fueron las más abundantes. Ninguno de estos aguiluchos mostraron tendencias a incrementar o disminuir sus números en un período de 20 años de estudio, pero las tres especies de *Buteo* mostraron un gran incremento en sus números posteriorm a una sequía en 1977. Sugerimos que en algunos casos, un pequeño número de conteos puede proveer útiles datos y conteos en diferentes localidades pueden proveer de información sobre estrategias migratorias de adultos y juveniles. [Traducción de Ivan Lazo]

Starting in 1974, we (Trost and others) counted raptors, primarily buteos, every year during their fall migration at Henry's Lake, Idaho. Results to 1983 were reported previously (Taylor and Trost 1985). We used road counts for these surveys, rather than the stationary counts usually employed for migration counts (Fuller and Mosher 1987). More recently, we have expanded the number of counts made each fall. Our purpose was to evaluate the importance of these extensive meadows near the continental divide as a short-term foraging site, and to characterize the timing and duration of hawk migration in the area. Under the conditions of our survey, we found that a limited number of road counts yields useful information on migrating raptors.

METHODS

Henry's Lake is located in northeastern Idaho, near the border with Montana west of Yellowstone National Park. The area surrounding the lake is largely wet meadows and big sagebrush (*Artemisia tridentata*) flats; elevation of these areas is about 2000 m. Much of the area is used for cattle grazing; some of the grazed area is sagebrush grass-

land and a small portion is irrigated pasture. The flats around the lake represent the majority of the treeless area in the vicinity. Stands of conifers surround the basin with lodgepole pine (*Pinus contorta*) on the lower slopes and Douglas fir (*Pseudotsuga menziesii*) more plentiful on the mountain slopes to the west and south. Henry's Lake lies at the north end of a north to south valley through which the Henry's Fork of the Snake River flows south to the Snake River Plain above the town of Ashton, Idaho. The Centennial Mountains are to the west and the Henry's Lake Mountains lie to the east. North of the lake, Reynolds Pass leads to the broad valley of the Madison River, which opens into the plains of southwestern Montana. Thus, the Henry's Lake area may be in a natural migratory corridor between the northern plains and the Snake River plain. In this respect, the study area may be like traditional hawk-watch sites, which are usually located where geographic factors concentrate hawks into a small area.

Our survey route covered approximately 53 km around the lake, primarily through open areas but extending into patchy lodgepole pine habitat on the south side of the lake for approximately 6 km. We surveyed between the middle of August and the end of September. Surveys started at approximately 0630 H, and we attempted to finish before 1030 H. We counted all raptors seen along the survey route. Since most of the terrain is open, some were counted

at distances up to 400 m or more, but most were counted on power poles or fence lines within 100 m of the road. During this time of day raptors generally remained perched, either in trees or on the numerous power poles and fence lines in the vicinity. Mornings were cold during the survey period, and warmed slowly to temperatures appropriate for soaring by hawks. We seldom saw raptors flying or soaring until the very end of a day's count, indicating that we were unlikely to double-count birds. For more detail on the survey method, see Taylor and Trost (1985).

We present our summary of the number of hawks observed each year as either a single survey in a given year (1974–79, 1981, 1984, 1986, 1987), the average of two observations (1980, 1982, 1983, 1985), or the average of three or more counts (all other years). Thus, the numbers differ slightly from those previously reported, because Taylor and Trost (1985) used the high count from each year with two counts (none of the years they reported had more than two counts). For 1990 through 1993, the number of hawks is the average of counts made between 18 August and 14 September, although we made counts before and after these dates. Counts in earlier years were made between these dates, so the timing of observations is consistent for all years. In addition, numbers of hawks counted tended to decline after 14 September (see below). Thus, all counts were made near the time when hawk numbers peak in the study area.

RESULTS AND DISCUSSION

The most frequently observed raptors were the red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), and ferruginous hawk (*Buteo regalis*). We report only the data for these three species.

Our counts show no clear increase or decrease in the numbers of these three species from 1974–93 (Fig. 1). However, all three hawks increased substantially in numbers from 1979–81, with subsequent counts falling to approximately pre-1979 levels.

Swainson's hawks are sometimes considered to be declining, either in the West as a whole (White 1994) or regionally (Harlow and Bloom 1989), but our counts showed relatively steady numbers of this species. Many observers (cited in Olendorff 1993) have considered ferruginous hawks to be declining in numbers. Figure 1 shows no strong trend in counts of this species, although there may be a slight downward trend overall.

Ferruginous hawks observed at Henry's Lake may be following the continental divide from north to south, since they often migrate in a north to south direction along the divide (Harmata 1981). They may also be reacting to prey availability by migrating eastward up the Snake River plain. At lower elevations near Boise, ground squirrels (*Spermophilus* spp.) begin estivation in early July, and black-tailed

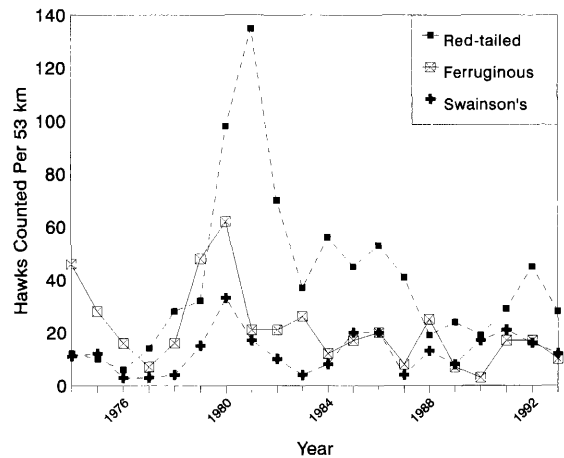


Figure 1. Counts of red-tailed, ferruginous, and Swainson's hawks near Henry's Lake, Idaho, from 1974–93. Numbers are the averages of counts taken between 18 August and 14 September (some years include only a single count; see text).

jackrabbits (*Lepus californicus*) become inactive during the day. The hawks then move eastward through the Henry's Lake area and other montane meadows, where ground squirrels remain active until late August. They may then move across the divide and into the Yellowstone National Park area (Thurow et al. 1980). Thus, our counts may reflect hawks moving both from the north and from the southeast. In addition, our data may include some juveniles fledged from relatively local nesting areas.

Peak hawk migration at Henry's Lake occurred in late August and early September (Fig. 2). Counts within a given year show the same fairly smooth pattern as the weekly averages shown in Fig. 2, with peak numbers in the last week of August or the first week of September. This indicates that our observations prior to 1990 most probably occurred near the peak of migration, and we feel that Fig. 1 gives a good representation of migratory hawk numbers at Henry's Lake.

The sharp increase in overall numbers in 1980–81 (Fig. 1) is thus likely to be real and not an artifact of the small number of counts in earlier years. The limited number of data points precludes statistical analysis, but the coincidence both in peak years and in the shape of the curve for all three species, as well as the fact that numbers of red-tailed and ferruginous hawks were substantially higher than those observed

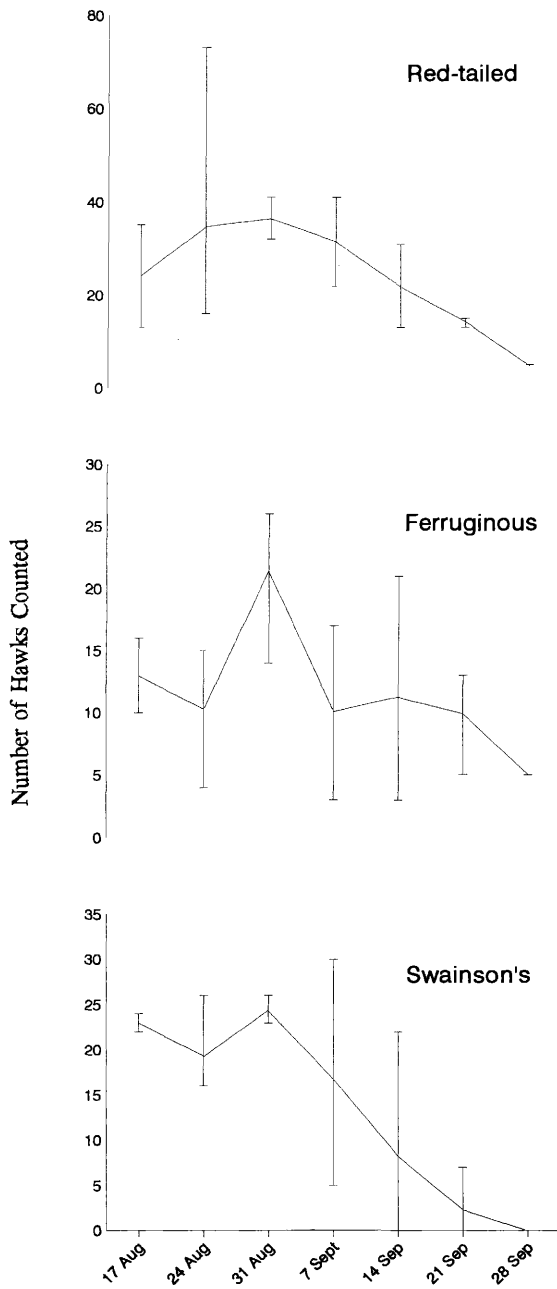


Figure 2. Counts of red-tailed, ferruginous, and Swainson's hawks near Henry's Lake, Idaho, from early August to late September, 1990-93. Vertical bars show maximum and minimum numbers observed in these years; average numbers for the four years are connected by the straight lines. Counts were made in the week preceding the date

in other years, gives confidence to the conclusion that hawk numbers were exceptionally high in these years.

These high counts might be due to advantageous local conditions that attracted an unusual number of migrating buteos. However, the counts could also reflect population increases after the prolonged drought of 1973-77, which occurred over most of western North America. A recovery in hawk populations subsequent to a drought might be delayed until after prey populations recover, accounting for the rise in counts in 1980-81 rather than immediately after the end of the drought. We are continuing the surveys, and will be able to determine if any similar pattern occurs following the end of the current drought (which continues despite high precipitation in winter 1992-93).

Hawk counts from our surveys may yield somewhat different results than those obtained at traditional hawk-watch sites. At those sites, hawks are channeled through a very small area by geographic factors, and the hawks counted are presumably a representative sample of all age classes and both sexes in the population. Local surveys, in contrast, may count a nonrepresentative sample of the population, since adult and immature hawks do not generally migrate together (Newton 1979).

Some of the hawks we observed might have been juveniles moving from their natal areas prior to actual southward migratory movement. Our peak numbers for red-tailed and ferruginous hawks occur earlier than other observed migration times in the northern United States, which show red-tailed hawks dispersing in August and moving southward in mid-September and ferruginous hawks starting migration in late September, after ground squirrels begin hibernation (Palmer 1988). However, the position of Henry's Lake south of the western Montana plains and between two mountain ranges indicates its potential as a stopover point on a migratory corridor, and our early dates may simply be the result of the northern latitude of the study site. Since the Henry's Lake area offers limited nesting habitat for Swainson's and ferruginous hawks, the appearance of a large number of juveniles prior to actual migration could indicate that their post-fledging movements are not random in direction.

← shown; only one count was made for the week of 28 September.

Hawk counts require a considerable expenditure of time and money. Based on our data, we suggest that in areas where migration peaks at a consistent time of year, a relatively small number of counts may result in very useful data. Counts in areas of varying habitat and topography could be used to investigate differences in migratory habitat use by adults and immatures, as well as general habitat use during post-fledging movement and migration. Identification of this habitat may be of considerable importance for raptor conservation: the area surrounding Henry's Lake has been subdivided and the number of houses is increasing rapidly. If this and other similar areas are important migratory staging or stopover areas, they should be identified and protected.

ACKNOWLEDGMENTS

Help with field work was provided by M.F. Delate, L.C. Farley, S. Grothe, D.B. LeMaster, M.P. Mahoney, L.R. Powers, T.D. Reynolds, and D.M. Taylor. The manuscript benefitted from review by S. Patla, C. Preston, and two anonymous referees.

LITERATURE CITED

- FULLER, M.R. AND J.A. MOSHER. 1987. Raptor survey techniques. Pages 37-65 in B.A. Giron Pendleton, B.A. Millsap, K.W. Cline and D.M. Bird [Eds.], Raptor management techniques manual. Sci. Tech. Ser. No. 10, Natl. Wildl. Fed., Washington, DC U.S.A.
- HARLOW, D.L. AND P.H. BLOOM. 1989. Buteos and the golden eagle. Pages 102-110 in B.A. Giron Pendleton, B.A. Millsap, K.W. Cline and D.M. Bird [Eds.], Raptor management techniques manual. Sci. Tech. Ser. No. 10, Natl. Wildl. Fed., Washington, DC U.S.A.
- HARMATA, A.R. 1981. Recoveries of ferruginous hawks banded in Colorado. *North Am. Bird Bander* 6:144-147.
- NEWTON, I. 1979. Population ecology of raptors. Buteo Books, Vermillion, SD U.S.A.
- OLENDORFF, R.R. 1993. Status, biology, and management of ferruginous hawks: a review. USDI Bur. Land Manage., Boise, ID U.S.A.
- PALMER, R.S. 1988. Handbook of North American birds Vol. 5, Yale Univ. Press, New Haven, CT U.S.A.
- TAYLOR, D.M. AND C.H. TROST. 1985. Fall raptor concentration on Henry's Lake flats. *Raptor. Res.* 19: 143-144.
- THUROW, T.L., C.M. WHITE, R.P. HOWARD AND J.F. SULLIVAN. 1980. Raptor ecology of the Raft River Valley, Idaho. DOE Contract No. DE-AC07-76 ID01570. EG&G Idaho, Inc., Idaho Falls, ID U.S.A.
- WHITE, C.M. 1994. Population trends and current status of selected western raptors. Pages 161-172 in J.R. Jehl Jr. and N.K. Johnson [Eds.], A century of avifaunal change in western North America. *Stud. Avian Biol.* No. 15.

Received 1 August 1994; accepted 26 December 1994