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BREEDING POPULATIONS OF SWAINSON'S HAWKS, RED-TAILED HAWKS, AND GOLDEN EAGLES IN NORTH CENTRAL OREGON: 1975–1982 AND 1999

Stewart W. Janes¹

ABSTRACT.—Populations of breeding Swainson's Hawks (*Buteo swainsoni*), Red-tailed Hawks (*B. jamaicensis*), and Golden Eagles (*Aquila chrysaetos*) present in 1999 were compared with populations present between 1975 and 1982 at a 129-km² site in north central Oregon. Populations of Red-tailed Hawks and Golden Eagles remained unchanged, but the number of Swainson's Hawk pairs increased from 15 to 17. In 1999 Golden Eagles used nests occupied between 1975 and 1982, and 7 of 31 pairs of Red-tailed Hawks used nests occupied in the earlier years. No Swainson's Hawks nested in trees occupied earlier. Few changes in territorial boundaries were detected.

Key words: *Aquila chrysaetos*, *Buteo jamaicensis*, *Buteo swainsoni*, *Golden Eagle*, *population change*, *Red-tailed Hawk*, *Swainson's Hawk*.

Population trends and current population status of raptors in the western United States have attracted much attention (e.g., National Wildlife Federation 1989, White 1994). While populations of many species are stable or even increasing, several species including the Swainson's Hawk (*Buteo swainsoni*) have declined over large portions of their range, but the causes are poorly understood (e.g., Bloom 1980, Littlefield et al. 1984, Herron et al. 1985).

Studies that span several years are of value in illuminating trends and suggesting reasons for population changes (e.g., Craighead and Mindell 1981). The purpose of this study was to revisit an assemblage of raptors studied between 1975 and 1982 (Janes 1984, 1985) and compare populations of Swainson's Hawks, Red-tailed Hawks (*Buteo jamaicensis*), and Golden Eagles (*Aquila chrysaetos*) at that time with those in 1999.

STUDY AREA AND METHODS

The original study area encompassed 137 km² in the vicinity of Antelope, Wasco County, Oregon. The area is a mosaic of dryland wheat and grazing land. Native vegetation includes perennial grasses (*Pseudoroegneria spicata*, *Festuca idahoensis*, *Poa secunda*; Franklin and Dyrness 1973), though a long history of grazing has reduced their abundance; annual grasses

(e.g., *Bromus tectorum*, *Taeniatherum caput-medusae*) are now widespread. Other natural vegetation includes shrubs (*Artemisia tridentata*, *Chrysothamnus nauseosus*, *C. vicidiflorus*) and western junipers (*Juniperus occidentalis*), which occur at varying densities. Common nesting sites for raptors include junipers, short (<10 m) cliffs that follow watercourses, and locusts (*Robinia pseudoacacia*) and poplars (*Populus nigra*) that occur at many residences and abandoned homesteads. Janes (1984) presents a more detailed description of the study area.

Land use changed little between 1975–1982 and 1999. The same fields were under cultivation with the same crop types, mostly dryland wheat and some alfalfa along the perennial streams. One difference involved the loss of many junipers to fire on 14.5 km² of the study area in 1994. Prior to the burn this area contained the highest juniper density in the study area.

During April and May 1999, I revisited the area for 10 days. Because of changes in land ownership, I was able to survey only 129 km² (94%) of the original study area for Swainson's Hawks, Red-tailed Hawks, and Golden Eagles. The 1975–1982 data presented in Table 1 reflect populations on areas surveyed again in 1999.

I recorded the positions and movements of all individuals visually detected between dawn and dusk (123 total hours of observation) on

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TABLE 1. Populations and territory occupancy of 3 raptor species at 2 periods of time on 129 km² in north central Oregon.

	Swainson's Hawk	Red-tailed Hawk	Golden Eagle
Pairs 1975–1982	15	31	2
Pairs 1999	17	31	2
Net change	+2	0	0
New territories in 1999	4	1	0
Territories vacant in 1999	2	1	0
Territories with altered boundaries	2	5	0

7.5' U.S. Geological Survey topographic maps for comparison with home range and territorial maps compiled for the 1975–1982 populations. Territories and home ranges are largely coincident among *buteos* in these populations (Janes 1984, 1985). Between 1975 and 1982, territory boundaries remained relatively stable (Janes 1984, 1985, 1994), often conforming to topographic features such as ridges. During this time only a single change occurred in territory occupancy. In 1981 a pair of Red-tailed Hawks replaced a pair of Swainson's Hawks that had occupied the territory for 6 years previously. Data presented in Table 1 reflect this change.

A territory was considered vacant in 1999 if no individuals of the species present between 1975 and 1982 were observed. A territory was considered new if a pair and active nest were observed in an area in 1999 where none had been observed previously. In 1999 the movements of some pairs of *buteos* did not closely conform to territorial boundaries mapped between 1975 and 1982. A territory was considered to have altered boundaries if it overlapped an earlier territory by >50% but now included new land equivalent to >25% of the area of the previous territory. Usually, changes involved the extension of a territory beyond a ridge that had been the previous limit and into a new watershed.

RESULTS

Populations of the 3 species changed little in the 24 years since the 1st survey; however, populations of Swainson's Hawks increased by 2 pairs (Table 1). Four new territories of Swainson's Hawks were located, all in areas previously unoccupied by *buteos*. Two territories occupied by Swainson's Hawks between 1975 and 1982 but not in 1999 were occupied by

Red-tailed Hawks, and their nests were located within 250 m of nest sites used earlier (1975–1982) by Swainson's Hawks. Territories of the 2 pairs of Swainson's Hawks with altered boundaries incorporated areas previously unoccupied by any *buteo*, and Red-tailed Hawks now occupied a portion of an area left unused in 1 instance. None of the changes occurred in the area burned by the 1994 fire. In 1999 no Swainson's Hawk occupied the same nest or nest tree used between 1975 and 1982.

The number of Red-tailed Hawks remained unchanged. Only 1 territory occupied in 1975–1982 was vacant in 1999 and a single new territory was observed. Of the 5 territories with altered boundaries, 2 incorporated areas not previously occupied by any *buteo*. The others involved movement into areas occupied by Swainson's Hawks in 1975–1982. Seven pairs of Red-tailed Hawks used nests that were occupied 1 or more years between 1975 and 1982. An additional pair reared young in a poplar used earlier, but the nest was in a new location within the tree.

Golden Eagle populations did not change and they reared young in nests used 1975–1982. Two alternate nests present on each territory in 1975 remained in 1999.

DISCUSSION

Raptor populations in north central Oregon showed remarkable stability not only in the number of pairs present but also in the location of territories. A high level of apparent consistency in territorial boundaries had already been observed in Red-tailed Hawks from 1975 to 1982 (Janes 1984).

Throughout the western United States, populations of Red-tailed Hawks and Golden Eagles appear to be mostly stable with some local increases and declines (Harlow and Bloom

1989, White 1994). Swainson's Hawks, in contrast, have declined in many areas including California (Bloom 1980), Nevada (Herron et al. 1985), Wyoming (Craighead and Mindell 1981), Oregon (Littlefield et al. 1984, Janes 1987), and Saskatchewan (Houston and Bechard 1983). The reasons for these declines are unclear but may involve pesticide use in their South American wintering areas. Pesticides may either reduce food supplies or directly kill the birds (Goldstein et al. 1996). Another contributing factor may be habitat changes in their breeding area often favoring Red-tailed Hawks at the expense of Swainson's Hawks (Janes 1987). Two changes in the location of Red-tailed Hawk territories involved inclusion of areas occupied by Swainson's Hawks in 1982.

Declines were first noted in Oregon in the early 1900s (Gabrielson and Jewett 1940) and continued at least through the 1960s (Marshall 1969). In southeastern Oregon a period of substantial decline was noted in the 1950s (Littlefield et al. 1984). Findings in this study show no declines in a Swainson's Hawk population between 1975 and 1999. Instead, the 17 pairs present in 1999 represent a 13% increase.

The increase in the number of Swainson's Hawks may be due to changes in pesticide use in the wintering area leading to an increase in winter survivorship. Changes in breeding habitat may also be involved. Aerial photographs taken by the Agriculture Stabilization and Conservation Service show a dramatic increase in juniper numbers between 1937 and 1979 at this site (Janes 1987). No further expansion of juniper populations was obvious between 1979 and 1999. However, the size of existing junipers increased. In 3 locations lacking larger junipers, seedlings too small to support a nest in 1975 served as Swainson's Hawk nest sites in 1999. The increase in nesting habitat in some areas may be offset in others, in part, for a similar reason. Red-tailed Hawks use larger trees for nest sites than Swainson's Hawks (Cottrell 1981). The movement of Red-tailed Hawks into areas previously occupied by Swainson's Hawks in 1999 may have been due to an increase in potential nest sites, as well as foraging perches, as junipers matured.

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