

RAPTOR RESEARCH

A QUARTERLY PUBLICATION OF THE RAPTOR RESEARCH FOUNDATION, INC.

VOL. 18

SPRING 1984

No. 1

HISTORY AND PRESENT STATUS OF SWAINSON'S HAWKS IN SOUTHEAST OREGON

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ABSTRACT - Similar to other isolated localities, Swainson's Hawks have declined in southeast Oregon. Formerly, the most commonly nesting *Buteo* in the Malheur-Harney Lakes Basin, the species became uncommon after the 1950's. Population declines have also been noted during migration. Reasons for the decline are unknown, but several theories are presented.

Declines in Swainson's Hawk (*Buteo swainsoni*) numbers have been reported from California (Bloom 1980), Nevada (Herron and Lucas 1968) and southern Saskatchewan (Houston and Bechard 1983). Here, we report a similar decline in southeast Oregon. A summary of the species' nesting and migratory status is given from 1875 through 1983, based on U.S. Fish and Wildlife Service (FWS) files, and reports by early ornithologists who worked in the Malheur-Harney Lakes Basin. Data were limited in certain periods, but enough accounts have accumulated to provide a general trend for the region.

STUDY AREA

Most information has been collected on or near Malheur National Wildlife Refuge Harney Co., Oregon (Figure 1). The refuge consists of 73,219 ha of freshwater marshes, two large lakes and uplands with big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus* spp.) and/or greasewood (*Sarcobatus vermiculatus*). Many km of riparian habitat are available along water systems, particularly in the southern portion of the refuge. The main units are Malheur, Harney and Mud lakes, Double O and Blitzen Valley. The Blitzen Valley contains the most important habitat for Swainson's Hawks because of the amount of riparian vegetation present. The valley extends south from Malheur Lake about 67 km.

Surrounding the refuge are great expanses of shrub-steppe. Big sagebrush is the dominant plant, but in many regions western juniper (*Juniperus occidentalis*) is characteristic (Franklin and Dyness 1973). Within this shrub-steppe region the Bureau of Land Management (BLM), in cooperation with the U.S. Fish and Wildlife Service, conducted a nesting raptor inventory from 1976 through 1980. Malheur NWR was located within the 26,379 km² raptor inventory area; however, most of the study area was on lands administered by the BLM (Figure 1). Information from the BLM study are included in this report.

Southeast Oregon is within the Basin and Range province, and is a continuation of this physiological province in Utah, Nevada, Arizona, New Mexico and California. The province is mostly about 1200 m elevation, with north-south trending fault-block mountains and basins of internal drainage (Baldwin 1964). The

highest point in southeast Oregon is Steens Mountain, Harney Co., which attains an elevation of 2958 m.

Nesting habitat for Swainson's Hawks has been riparian zones on Malheur NWR, and widely scattered junipers throughout the surrounding uplands. In the spring, the species is usually seen near agricultural areas, while in the fall principle feeding habitat is newly mowed meadows where an abundance of rodents, particularly montane voles (*Microtus montanus*), are left exposed.

MATERIALS AND METHODS

Most records were obtained from Malheur NWR files and early documents from ornithologists who worked in the region from 1875 through 1932. From 1940 through 1983 information was primarily from Malheur NWR Annual Narrative Reports (NR). Beginning in 1975, 360 km of raptor road counts were initiated on and surrounding the refuge (Figure 2). During the periods when Swainson's Hawks were in the basin, surveys were conducted in April, June and August 1975, 1977, 1979, 1980, 1982 and 1983. Transects were driven at 32 kph with stops for 3 min every 1.6 km. Counts were completed between 10:00 and 15:30.

RESULTS

1875-1939. — Swainson's Hawks were first recorded in southeast Oregon in 1875 when Charles Bendire found the species quite common in the Malheur-Harney Lakes Basin (Brewer 1875). Bendire (1877) later considered it a common summer resident, generally distributed throughout the basin. They were found nesting in willows (*Salix* spp.) along streams and in isolated junipers and pine trees on the edge of the forest. He collected 25 egg sets which usually numbered 2, and rarely 3/ clutch.

We know of no additional records until brief mention was made of several being seen in 1915 (refuge files). Willett (1919) saw 2 individuals near Malheur Lake on 26 June 1918 and 2 additional birds on 27 June. The species was considered fairly common in August 1918, but these could have been migrants. Willett further reported that between



Figure 1. Location of Bureau of Land Management's nesting raptor inventory study area, in respect to Malheur National Wildlife, Oregon.

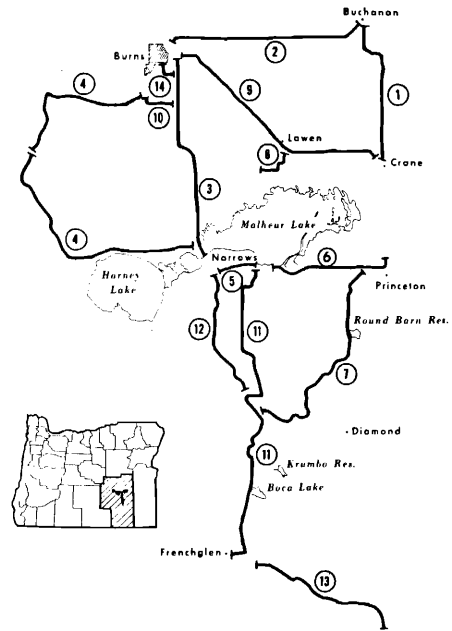


Figure 2. Locations of raptor road transects in the Malheur-Harney Lakes Basin, Oregon.

Malheur NWR and Klamath Falls, Klamath Co., Oregon the species was common along most of the route, and particularly abundant in canyons and slopes on Warner Mountains, in Lake Co. On 24 May 1920, 27 were counted as they perched on fence posts along one side of an alfalfa (*Medicago sativa*) field near Burns, Harney Co. The field contained numerous ground squirrels, and the hawks were catching rodents for food (Gabrielson 1922). Based on the lateness of the season, these birds probably represented locally nesting individuals. Prill (1922) found the species very common near Burns and as far south as Wright's Point (16 km S of Burns) from 25 May to 15 June 1921. They were commonly nesting in trees on the surrounding hills. In 1922, the Swainson's Hawk was considered the most common of the large hawks in the basin during the summer months. The species nested in junipers bordering Harney Valley where it consumed large numbers of 2 species of ground squirrels (FWS files).

Jewett (1936) considered the Swainson's Hawk as equal in numbers with the Red-tailed Hawk (*B.*

jamicaensis), indicating the species had declined somewhat between 1922 and 1932. Gabrielson and Jewett (1940) reported it was once one of the most common raptorial birds in eastern Oregon, and could still be considered a common summer resident despite a noticeable decrease in numbers during recent years. Preferred nesting habitat was reported as gnarled, twisted junipers. Forty-two egg sets collected in Oregon between 1924 through 1960, on deposit at the Western Foundation of Vertebrate Zoology, showed 64.3% in junipers, 16.6% in willows, and 19.1% in other tree species (L. Kiff, pers. comm.).

1940-1959. — Swainson's Hawks were still common in southeast Oregon in the 1940's. An estimated 150 individuals were present on Malheur NWR in the summer of 1941, from which 12 nestlings were banded. At this time some pairs were nesting in sagebrush in the northern portion of the Blitzen Valley. This nesting habitat continued to be used through the mid-1940's. From 1944 through 1947 the nesting population remained unchanged.

Table 1. Number of Swainson's(SW) and Red-tailed(RT) Hawks observed on raptor transects in the Malheur-Harney Lakes Basin, Oregon.

		TOTALS (#/KM)					
Month		1975	1977	1979	1980	1982	1983
April	SW	4 (.011)	2 (.006)	1 (.003)	0 (.000)	13 (.036)	2 (.006)
	RT	26 (.072)	21 (.058)	16 (.044)	31 (.086)	38 (.106)	56 (.156)
June	SW	2 (.006)	20 (.060)	8 (.020)	18 (.050)	4 (.011)	7 (.019)
	RT	14 (.039)	46 (.128)	29 (.081)	67 (.186)	63 (.175)	36 (.100)
August	SW	7 (.020)	16 (.040)	20 (.060)	30 (.080)	26 (.072)	23 (.064)
	RT	46 (.128)	55 (.153)	67 (.186)	96 (.267)	60 (.167)	31 (.086)

In 1947, it was still the most commonly seen raptor with an estimated 150 individuals. No information was available from 1948 through 1957, but there was no indication of change in the species' status.

In the late 1950's the population began to decline. In 1958, several pairs nested in willows on Malheur NWR. A rodent infestation occurred from May through August, but no Swainson's Hawk increase was noted on the refuge. However, neighboring valleys had larger populations of both Swainson's and Red-tailed Hawks. In 1959, a reduction in the local nesting population was reported (Refuge N.R.)

1960-1983. — In the 1960's, low populations of Swainson's Hawks persisted. The species increased by 2 pairs on the refuge in 1960, but their numbers were low compared with those of previous decades. By 1962 there were only 2 nesting pairs. Pair numbers fluctuated through the 1960's, with the highest number recorded in 1966 with 5 pairs. Four pairs were present in 1967, and for the first time in recorded history there were no nesting Swainson's Hawks on Malheur NWR in 1968. However, in 1969 and 1970, 2 pairs were present, increasing to 3 pairs in 1971. This was the last nesting record in willows, and the last until 1979 in any habitat on Malheur NWR. The 1979 nesting effort was in a juniper and unsuccessful. Eggs were incubated but did not hatch.

In the BLM study area (Fig. 1), 18 Swainson's Hawk breeding territories were located in 1980. Densities were one pair/1,465 km² on the BLM study area. The nearest nesting pair to Malheur NWR was 9.6 km east. Johnstone, et al. (1980) re-

ported all 18 nests were in western juniper. Mean tree height was 5.5 m and mean nest height was 5.0 m. Nesting trees were mostly isolated, near or in stands of low structured vegetation such as crested wheatgrass (*Agropyron cristatum*), alfalfa, or cheatgrass (*Bromus tectorum*). The majority of nests located in the past 7 years has been near sagebrush removal projects. Prey remains collected at the nests indicated their major prey was Horned Larks (*Eremophila alpestris*), Western Meadowlarks (*Sturnella neglecta*), ground squirrels, various small mammals and insects (Johnstone, et al. 1980).

Swainson's Hawk numbers have varied on June raptor transects (Table 1), and consisted of single individuals or pairs. Single individuals were assumed to have a mate incubating or brooding at the time the transect was conducted. In 1975, only 2 birds were recorded, but 20 were noted in 1977. Seven were seen on the 1983 transects. Most of these birds were associated with agricultural or crested wheatgrass areas located east and west of Burns, Oregon. None was recorded in riparian habitat. Most Swainson's Hawks seen on the 1977, 1979 and 1980 transects were members of pairs whose nests had been previously located by BLM personnel during nesting raptor inventory studies.

Migrational Accounts. — Little historical information was available on Swainson's Hawk migration in southeast Oregon. Leopold (1942) observed 37 (0.58/km) in August 1941 on a single trip through the Blitzen Valley, and reported the species as the most commonly seen raptor on Malheur NWR. A total of 56 individuals was seen on 1 August and 50 on 1 September 1947 (Refuge N.R.).

Road transects conducted in April and August 1975, 1977, 1979, 1980, 1982 and 1983 (Table 1) indicated Swainson's Hawks were no longer a common species during spring and fall migration in the Malheur-Harney Lakes Basin. Before the 1960's the species was considered more common than the Red-tailed Hawk. When comparing the two from transect data, Red-tailed Hawks were more common than the Swainson's Hawk (Table 1).

DISCUSSION

Reductions in the Swainson's Hawk nesting population in southeast Oregon, Nevada and northeast California are presently unexplained. In southeast Oregon, juniper and riparian habitats are available and appear adequate for nesting sites, therefore, other factors are apparently involved. A recent increase in the Great Horned Owl (*Bubo virginianus*) in riparian habitat on Malheur NWR could be responsible for the disappearance of nesting Swainson's Hawks in willows. An active nest in 1962 was taken over by a Great Horned Owl pair in 1963. Swainson's Hawks have not nested in this area since. In 1966, there was an active hawk nest 1.6 km east of the site and it could have been the displaced pair. Newton (1979) reported Swainson's Hawks nesting close to Great Horned Owls had significantly less success than those nesting in tree clumps lacking these predators. In Washington, Fitzner (1980) reported distances between Swainson's Hawk and Great Horned Owl nests ranged from 2.2 to 3.1 km indicating less tolerance to Great Horned Owls than to other raptorial birds. Smith and Murphy (1973) also found the species nested far from Great Horned Owls (mean distance 3.54 km). Both of these studies reported a low tolerance between the two species.

Another possible factor for the species' decrease is a reduction in foraging sites within a pair's territory. Yensen (1980) reported vegetation in southwest Idaho was once a mosaic dominated by open stands of sagebrush with an understory of perennial grasses. The vegetation was severely damaged by sheep and cattle in the late 1800's and early 1900's. Added to a 14-year dry period, culminating in the severe drought of 1934, the native grass understory was virtually eliminated. A similar condition occurred in southeast Oregon. As native grasses disappeared because of overgrazing, sagebrush became the dominant plant. Accompanied with fire suppression by federal agencies, large monotypic stands of sagebrush have been per-

petuated. Bechard (1980, 1982) reported hunting sites by Swainson's Hawks in Washington was not based on prey density, but more likely on vulnerability of prey to predation. With dense stands of sagebrush the vulnerability of prey for the species probably was reduced, resulting in Swainson's Hawks abandoning many regions of southeast Oregon. The 18 territories reported by Johnstone, et al. (1980) were mostly near low structured vegetation and away from dense monotypic shrubs.

Another possibility is the local nesting population is being limited either in migration or on their wintering areas. The species has been reported as having difficulty in their Argentine wintering regions where large scale use of pesticides has been used for locust control (N. Smith, pers. comm., Olrog 1967). Locust are apparently an important prey base for Swainson's Hawks in Argentina. If this agricultural activity is occurring in localized regions, the Great Basin population could be wintering in such an area. This might account for the decrease in nesting pairs in southeast Oregon, northeast California and Nevada when compared with other populations in western North America. Henny and Kaiser (1979) found low levels of DDT and its metabolites in Swainson's Hawk eggs in northeast Oregon. Low levels of DDT were also found in eggs collected in northeast California in 1982 and 1983 (R. Schlorff, pers. comm.). Therefore, it is reasonable to assume DDT is not responsible for the decline of Swainson's Hawks in the northern Great Basin, but other pesticides might be involved. Only 6 years data are available from raptor transects, but there appears to have been a decline in spring migrants (except in 1982). However, migrant counts in August have remained relatively stable since 1979 (Table 1). If the same migration corridors were used by individuals in spring (April) and fall (August), a major loss of Swainson's Hawks is occurring south of the Malheur-Harney Lakes Basin.

ACKNOWLEDGMENTS

We thank Larry Ditto, Charles Henny, Gary Ivey, Joseph Mazzone and David Paullin for reviewing, correcting and making suggestions concerning the manuscript, and Dee Dee Ehlers for typing assistance. Numerous employees of the U.S. Biological Survey and U.S. Fish and Wildlife Service collected and recorded data on the species, and to them we are deeply grateful. Lloyd Kiff provided egg set data from the Western Foundation of Vertebrate Zoology, Los Angeles, California.

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Received 26 December 1982; Accepted 1 March 1984.

Raptor Research Foundation Meeting. The 1984 annual meeting of the Raptor Research Foundation, Inc., will be held October 25-28 at Virginia Polytechnic Institute and State University, Blacksburg, Virginia. The tentative schedule is:

26-27	October	Paper and Poster Sessions
27	October	Banquet
28	October	Open

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