

Bald Eagles wintering in a Utah desert

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How does the species survive the winter in an environment far from water?

Photographs/ Joseph B. Platt

The nesting ecology of the Bald Eagle (*Haliaeetus leucocephalus*) has been described throughout its range by Dixon (1909), Broley (1947), Herrick (1924, 1932 and 1937), and Bent (1937). The bird's behavior during the non-breeding season however, has been treated only in a limited fashion. Southern (1963, 1964) reported two years' observations on more than two hundred eagles wintering along the Mississippi River in the Savanna Army Depot, Illinois. Hancock (1964) observed about one hundred wintering eagles in a maritime environment off the coast of British Columbia, Canada; this area was also used as a breeding ground. Both these populations were in close association with water and the waters provided the bulk of their food. The Mississippi River population fed primarily on Gizzard Shad (*Dorosoma cepedianum*) although two other species of fish were occasionally eaten and two deer carcasses were reported scavenged. The British Columbian population fed on ocean fish near the beaches; in a few areas, dead sheep were also utilized.

The marshes and rivers throughout Utah support a scattered wintering population of Bald Eagles. Swisher (1964) reported 17 Bald Eagles feeding in the Bear River waterfowl refuge on the shores of the Great Salt Lake. Such a group was believed uncommonly large for the state. In January of 1960 a group of 20 Bald Eagles were

seen in the desert valleys of Utah County, west of Provo, Utah (R.G. Bee, unpubl. field notes). This desert population was found to number between 100 and 118 birds and maintained no association with water. In 1966, serious study of these birds was begun (Edwards, 1969). Figure 1 shows the seasonal dynamics of the populations studied in British Columbia, Illinois and Utah. The purpose of this paper is to summarize what has been learned about this desert wintering population.

STUDY AREA

The eagles restrict their activities to two parallel valleys about forty-five miles long with a combined width of thirty miles. They contain a typical Great Basin flora. Greasewood (*Sarcobatus vermiculatus*), shadscale (*Atriplex confertifolia*), rabbitbrush (*Chrysothamnus stenophyllus* and *C. viscidiflorus*), and sagebrush (*Artemisia tridentata* A. t. var. *nova*, and *A. spinescens*) cover the valley floor in a mosaic of shrub communities. On the foothills Utah juniper (*Juniperus osteosperma*) becomes abundant. On the slopes of the surrounding mountains a mountain brush community is present, consisting of Gambels oak (*Quercus gambelii*), and mountain mahogany (*Cercocarpus ledifolius* and *C. montanus*). Juniper communities

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are also present but with the addition of pinyon pine (*Pinus monophylla*) at these higher elevations. The highest regions support Douglas fir (*Pseudotsuga taxifolia*) on the north facing slopes.

Owing to the heavy utilization of the valley floors for grazing sheep and cattle, the plant communities have been greatly modified. Exotic species such as halogeton (*Halogeton glomeratus*) and Russian thistle (*Salsola kali*) have become prevalent in some places. The native cheatgrass (*Bromus tectorum*) and the sagebrushes have greatly increased their importance.

ACTIVITY AWAY FROM THE ROOSTS

Eagles are seen in nearly all parts of the two valleys during the winter but there are areas which show high levels of eagle activity. These are the southern end of Cedar Valley, northern Cedar Valley by Cedar Fort, Utah, Rush Valley southeast of Faust, Utah, and the east and west slopes of the foothills dividing the two valleys. Besides these favored areas Bald Eagles can be seen perched throughout the valleys on telephone poles, lone juniper trees, and on open hillsides. A transect averaging 56.8 miles in length was driven ten times within the study area between December 10, 1971 and February 19, 1972. This sampled ten of the twenty weeks eagles were in the valleys. Eagles within the vicinity of the roosts were not counted. Bald Eagles were sited on an average of one every 11.1 miles. The first five weeks of transects averaged a Bald Eagle every 10.9 miles and the latter five weeks averaged an eagle every 11.4 miles. The consistency of the survey data confirms the stability of the winter population.

Eagles in small groups of three or four were occasionally seen; an interesting exception occurred when a series of 35 power poles had 24

eagles perched on them. No reason for the concentration was determined but food was generally associated with the smaller groups of eagles.

Golden Eagles are seen with small groups of Bald Eagles but Common Ravens and Black-billed Magpies are the most common companions of Bald Eagles in the hunting areas. Rough-legged and Red-tailed Hawks, which are winter residents, have been seen perched near Bald Eagles but no interaction was noted. Harriers, American Kestrels, and Prairie Falcons also winter in the study area. Eight other raptors, in addition to the seven species discussed, have been recorded during the winter on the study area; they are: Ferruginous Hawk, Sharp-shinned Hawk, Cooper's Hawk, Goshawk, Merlin, Great Horned Owl, Long-eared Owl and Short-eared Owl.

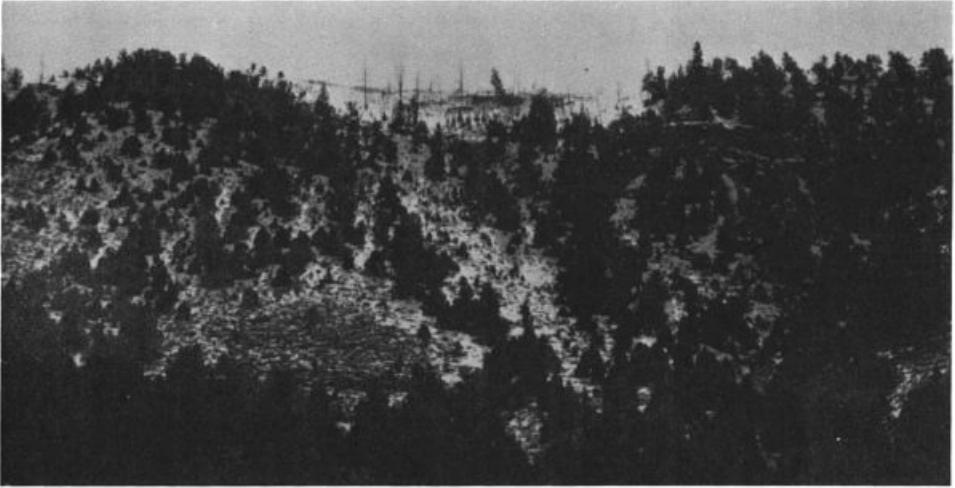
ROOST SITES

The entire population of Bald Eagles roosted in four well defined roost sites. Two are at high elevations in Douglas fir stands and two are on the valley floor in introduced black willow trees (*Salix nigra*). The mountain roosts receive the greatest amount of use in both numbers of birds using the roosts and number of nights the roosts are used (Table 1). Eagles in the mountain roosts spend the night in Douglas fir trees scattered along two or three hundred meters of steep canyon hillside. Night after night the same trees were selected for use by the birds. Both mountain roosts were on north facing slopes less than half way down from the ridge top. The first birds arriving each winter consistently use the Tintic Mountain roost. On the night it is used, it averages 26.7 eagles per night, with eighty-two being the largest number of eagles using the roost on a single night. The Oquirrh Mountains roost averages 20.0 eagles per night, a high of fifty-eight eagles was obtained at this roost in one evening.

Table 1
Bald Eagle Winter Roosts in Central Utah

Site	Elevation (in feet)	Species of tree	Largest number seen ¹	Average number of eagles on an occupied night ¹
Tintic Mt.	6800	Douglas Fir	82	26.7
Oquirrh Mt.	8100	Douglas Fir	58	20.4
Rush Valley	5500	Black Willow	40	12.0
Cedar Valley	5000	Black Willow	11	5.0

¹ It is believed that about 3% of the birds counted may have been Golden Eagles.



Tintic Mountain Roost.

The valley roosts received attention during the study area's period of highest eagle density (January and February). The Rush Valley roost consisted of ten black willow trees originally planted to surround a house. That house is now gone but there is an occupied farmhouse 150 meters away. The roost is encompassed by pasture land. Eagles begin utilizing this roost during mid-December and by the first of March it is empty. It averages 12.0 eagles per active night during its two-and-one-half months of use.

The Cedar Valley roost is the least important site of the four roosts. Birds used it during the same December through February period that corresponds to the other valley roost, but for those nights occupied it averages only 5.0 eagles. The black willow trees utilized are part of a windrow between two pastures. Of the dozen trees in the row only a central group of six is consistently used.

Night after night the same perches are used in all the roosts. Indeed, in the six year span of the study, the same perches are still in use.

BEHAVIOR AT THE ROOSTS

Extensive observations were made at the Rush Valley roost to determine the behavior of roosting birds. Observations at the other roosts were made to verify the conclusions drawn from the Rush Valley site.

No roost seemed to be favored by a particular age class. In January and early February, when the total number of eagles in the study area was fairly constant, the number of birds in a roost on consecutive nights fluctuated. Characteristically marked immatures would be present at a roost, then absent for a day, only to return on another census check. Besides the movement of individuals, weather patterns influenced roost utilization.

Neither valley roosts afforded the eagles protection from storms; mountain roosts appeared to receive these birds for the duration of stormy weather.

At the Rush Valley roost eagles were seen leaving one hour and 50 minutes before sunrise. As it becomes light, birds turn toward the sun and preen. Immature Bald Eagles invariably left the roost trees only to return in less than one minute. They would chase each other around the trees, then return and perch side by side. As many as three young eagles participated in these mock dog fights at one time. Three different times immatures were seen carrying large sticks while being chased by a second immature. Whenever a bird returned to the roost trees those in the roost would call with a high pitched chittering sound but no real aggression was noted.

Adult Bald Eagles behave in a different manner. When an adult leaves its perch, it flies directly out of sight. Age class did not determine whether a bird left early or late in the morning. If an individual fed late the day before, it is probably more likely to remain in the roost longer the following morning. When departing, they did so singly or in pairs. Craighead and Craighead (1956) reported all the harriers leaving their communal roost within a few minutes after daylight. Such a mass exodus was not seen at any Bald Eagle Roost.

Eagles can be found in the roost trees throughout the afternoon but the bulk of the birds arrive during the last two hours of light. They appear alone or in loose groups of three or four birds. At the mountain roosts this is rather dramatic because of the large number of eagles and the soaring conditions provided by the canyon walls. At these sites the birds landed in the roost area, then often rose to join other eagles in soaring. As many as twenty birds of all ages have been seen soaring above the Oquirrh Mountain roost. The valley

roosts receive the bulk of their birds later in the evening. Upon arriving, the eagles preen and occasionally change perches. Adults and immatures perch within a meter of one another. In the deciduous trees, perches in the tops of the trees are preferred; this is probably because it is easier for the big birds to utilize the exposed outer perches than to attempt to maneuver into the more protected perches in the inner part of the trees. Eagles using the Douglas firs of the mountain roosts perch close to the trunk.

Both valley roosts were within one mile of small rural communities and both were disturbed almost daily by the landowners. The birds seemed to become habituated to the individuals and their equipment. Although these men caused the eagles to leave the roost, the birds waited longer and flew shorter distances than when flushed by strangers.

Three species of birds are known to have spent the night in roosts with the Bald Eagles. Ravens are the most common; besides roosting, they often arrive in the roosts at dawn and remain for a few hours. Golden Eagles have been recorded in all four roosts. The Tintic Mountain roost contained a Golden Eagle on three out of every four census visits during two winters. The Cedar Valley roost often contains both species of eagles during the day. Subadult Golden Eagles are more common in the roosts than are adults. Rough-legged Hawk was recorded roosting in both valley roosts; although it is a common winter resident of the study area it enters the roosts very rarely.

HUNTING BEHAVIOR AND FOOD HABITS

Of prime interest was how such a large population of eagles could sustain itself without the usual fish resource described utilized in other studies. To determine prey taken by these desert Bald Eagles, pellets were gathered from beneath the roost trees. In 1971-1972, 1200 grams (dry weight) of pellets were collected throughout the winter from the Rush Valley roost. This represented a minimum of 115 castings. Ninety-eight percent of these pellets contained rabbit fur, two percent consisted of sheep's wool, Black-billed Magpie feathers, and hair from a domestic dog. A more cursory examination of pellets from the remaining roosts revealed the same heavy use of rabbits in all others.

Actual capture of prey by Bald Eagles was not recorded. Six times small groups of Bald Eagles were flushed from a freshly killed rabbit; on five of the incidents there was a Golden Eagle present and on the sixth occasion a Great Horned Owl breast feather was at the site. It appeared that Bald Eagles searched for food alone but when food was located



Quirrh Roost.

by either species of eagle, Bald Eagles and corvids converged on the site (see also Platt and Sherrod, 1974).

Obviously, over one hundred Bald Eagles could not survive by scavenging from the resident Golden Eagles. A more significant food source was indicated during the analysis of pellets from the Rush Valley roost. To separate bone fragments from the hair, pellets were individually soaked in a beaker of water and then stirred. Lead shot from shotgun shells was found in seventy-one percent of the pellets. It was usually number four shot size, this is a popular load for rabbit hunters. The shot was commonly deformed or fragmented, suggesting that it had struck bone and likely caused damage if not death. Besides the lead shot, quartzite gravel was recovered from six percent of the castings. Gravel does not occur naturally in the study area but is found along the shoulders of the fifty miles of improved roads that traverse the wintering area. When a rabbit is killed by a car on the road this gravel becomes ground into the animal and could be consumed, along with the flesh, by the eagle. Magpies and farm dogs are occasionally killed on these roads and such road killed animals may have provided the remains found in the pellets. Sheep's wool was also recovered; winter-killed sheep could be found throughout both valleys as a result of the extensive wintering of sheep.

Twenty-two percent of the pellets containing rabbit fur contained neither shot nor gravel. These could have come from rabbits killed with rifles instead of shotguns, or carcasses eaten without encountering any lead or gravel present, or some pellets could have come from rabbits killed by the Bald or Golden Eagles.

Small groups of Bald Eagles were flushed from frozen jackrabbit carcasses. They are commonly seen eating portions of rabbit carcasses on low



Rush Valley Roost. 15 + Bald Eagles.

perches or telephone poles and also bring food into the roost trees. During one season four hind legs and five skulls of Black-tailed Jackrabbits and one hind leg of a cottontail (*Sylvilagus sp.*) were gathered from the Rush Valley roost site. Cottontails are restricted to rocky or brushy areas around the foothills of the valleys. Their numbers are not significant when compared to the widespread distribution of Black-tailed Jackrabbits.

Observations strongly suggest that this population of wintering Bald Eagles relies heavily on an artificial food source — road and hunter killed Black-tailed Jackrabbits (*Lepus californicus*).

Potential prey items observed in the study area during the winter but not found in the prey remains were: Ring-necked Pheasant, Common Raven, Sage Grouse, Antelope Ground Squirrel (*Amospermophilus leucurus*), Pack Rat (*Neotoma lepida*) and domestic cats and chickens.

This desert population of wintering Bald Eagles has been known since 1960. Indications are that it may not have existed prior to that time. Residents and biologists in the area during the 1940s and 1950s do not recall the presence of the eagles or the use of the valley roosts. Perhaps the increased popularity of sport rabbit hunting provided a steady food source which attracted the birds from other areas. Such a phenomenon was recorded by Musselman (1949). He noted that Bald Eagles became common winter residents when a

slaughterhouse began dumping offal into the Mississippi River near Hamilton, Illinois. Refuse dumps in the Aleutian Islands also attract large numbers of wintering and nesting Bald Eagles (Sherrod, 1977).

Another explanation for creation of this desert population would be the loss of more typical wintering habitat which forced the eagles into new areas.

Perhaps the nesting site of these birds would help explain their selection of this unusual wintering location. Unfortunately, we do not know where they come from. A possible interim point in their southern movement was suggested by D.S. Shea (pers. comm.). Bald Eagles gather in Glacier National Park each fall for the salmon runs. More than 200 eagles are present during the first week of November, but by mid-December the eagles are gone. This sudden loss of birds corresponds with the rapid buildup noted in the central Utah population.

More work is needed on the effect of rabbit numbers on the wintering eagles. During the thirteen years since their discovery, the eagles must have experienced a cyclical low in the rabbit population. In spite of these low years, they are present every winter, suggesting that the population has become a permanent part of the desert's winter fauna. The habitat of the rabbits is likely to

remain abundant because of the extensive sheep and cattle grazing land use.

Besides an adequate food supply, freedom from disturbance is needed if this population is to continue its utilization of the desert valleys. Six Bald Eagles are known to have been shot in the study area. Two were killed prior to 1969 (Ellis *et al.*, 1969) and two were killed during the winter of 1971-1972. Another two Bald Eagles reportedly were shot but were rehabilitated and released. It is generally felt that the shooting pressure is slight and that the vast majority of eagles go unmolested. Both valley roosts are closely guarded by their respective landowners.

SUMMARY

A population in excess of one hundred Bald Eagles was observed on its desert wintering grounds. Unlike other wintering concentrations of Bald Eagles, these birds are not in association with a body of water. They roost communally in four widely spaced locations. Definite patterns of use were found for roost sites and the desert environment. The behavior of the adult eagles is different from immature birds but no expressions of dominance were noted. Fourteen species of raptors and two corvid species were seen in the area; various levels of interaction with the Bald Eagles were seen.

Pellet analysis, prey remains, and field observations confirm that Black-tailed Jackrabbits were the main food source; however, they suggested that a large portion of these rabbits were scavenged.

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Whooping Crane Bulletin

As of September 13, the 1976 crop of young Whooping Cranes, including those hatched at Patuxent Wildlife Research Center, Maryland, Grays Lake National Wildlife Refuge, Idaho, and Wood Buffalo National Park, Alberta, may total as many as seventeen out of a total of 32 eggs laid.

At Patuxent, five eggs were laid by two captive pairs. Two eggs kept at Patuxent failed to hatch, of these one was believed infertile. Two of the eggs laid at Patuxent were transferred to Grays Lake, where they were incubated by Sandhill Cranes there. Neither hatched. The remaining Patuxent egg hatched, and a healthy (although lame in one leg) chick survives.

At Grays Lake, 15 eggs taken from Whooping Crane nests at Wood Buffalo National Park were

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placed under Sandhill Crane foster parents. Of these, four were destroyed by predators (coyotes and/or ravens), and eleven hatched. Of these five survived, but as of August 30 only four could be accounted for. Of the four hatchlings that died, one succumbed to pneumonia and three were killed in a storm.

At Wood Buffalo National Park, twelve eggs hatched, although information on their survival is not available at press time. Of the 14 eggs taken to Grays Lake from Wood Buffalo in 1975, four survived the winter at Bosque Del Apache N.W.R. in New Mexico. Three of them have been reported in summer 1976 from Idaho, Montana, and Utah. We are indebted to James W. Carpenter, Research Veterinarian at P.W.R.C. for this report.