DISTRIBUTIONAL STATUS AND ECOLOGY OF BARN OWLS IN UTAH

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ABSTRACT. Past and present status of the Barn Owl (*Tyto alba*) in Utah is described. Distribution, breeding, food habits, and mortality are discussed. Data suggest that the Barn Owl is present in low numbers in much of the state and is reproducing at a rate above the minimum replacement rate. Food and nest sites do not appear to be limiting factors. However, winter cold and snow cover may limit the species in Utah.

Introduction

Until recently, little was known concerning the status and ecology of Barn Owls (*Tyto alba*) within the state of Utah. Behle (1941) published the first nesting record of this species near Kanab, Kane County, and later (1944) suggested it to be an uncommon resident, known to breed in the southern part of the state. Woodbury et al. (1949) proposed that Barn Owls were probably resident and widely distributed in the valleys and lower elevations throughout the state. More recently, Smith et al. (1972, 1974) presented information on Barn Owl foods and nesting ecology in the vicinity of Springville and Provo, Utah County.

In this paper we have attempted to summarize the available information on the distribution and ecology of this species in Utah. Since Utah is on the northern edge of the major Barn Owl distribution in the West, information in this paper may help to understand some of the factors limiting its distribution elsewhere. Field work was conducted during the course of our collective studies of raptor ecology in Utah: Smith from 1966 to 1972 and Marti from 1971 to the present. During these periods all portions of Utah were checked at least once and some, particularly the central and northern portions were thoroughly searched.

Distributional Status and Ecology

Although widely distributed throughout the United States and northward into southern Canada, the Barn Owl is of patchy occurrence in the intermountain area. Bailey and Niedrach (1965) considered it to be an uncommon resident in Colorado, Kansas, and Nebraska, and rare in Wyoming. Ligon (1961) reported few records from New Mexico and noted that Barn Owls were uncommon in the Southwest. Northward, they rapidly become rare, presumably because of their intolerance for cold weather, and, until recently, there was only a single record of this species in Idaho (Burleigh 1972).

Records of Barn Owls in Utah date from 1899. A summary of the occurrence records of this species within the state is presented in figure 1. Barn Owls have been recorded in twelve counties of Utah; specimens have been collected in seven of these counties, and nests have been found in six. The distribution is a narrow north-south crescent, from Cache and Box Elder counties in the north to Kane and Washington counties in the south, with an eastward

extension along the central portion of the state into Uintah County. No observations of this species are from the western or southeastern portions of the state, and only a single observation is from the south-central.

Analysis of historical records suggests that the distributional status of this species may have changed several times over the past 76 years. Prior to 1930, Barn Owls were seldom recorded but were apparently widespread along their present north-south corridor. With one exception, all observations during this period were from the central and northern portions of the state, and all the nesting records were from Utah and Box Elder counties. The reserve is found from 1931 to 1960, during which time Barn Owls were frequently recorded in the southwestern counties and rarely observed northward. In this 30-year period, over 70 percent of the observations and almost all nesting records and specimen collections were from the southwest counties. Records dating from the early 1960s to the present reveal another reversal marked by a northward displacement which is evidently still occurring. This most recent trend is notable for the comparatively high number of Barn Owl observations in northern Utah and southern Idaho. The recent change in the status of Barn Owls in Idaho is striking. Burleigh (1972) reported a single Barn Owl record for the state from Latah County in northern Idaho in 1947. Trost (pers. comm.), however, found Barn Owls prevalent in the Pocatello region during a 1968-69 period of *Microtus* abundance, and Smith and Burkholder (in press) reported the first known breeding record in Idaho in 1969 and observed another nest in 1972. Both nests were near the northern Utah state line.

Observations over the past 15 years indicate that Utah has two separate Barn Owl populations. A northern population occurs from Utah County north to Box Elder County and east to Duchesne County. Barn Owl densities in this population appear to be highest in Utah and Box Elder counties; recent observations of nesting exist for both. A considerably smaller southern population is found in Iron and Washington counties, but there are no recent observations of nesting. Barn Owls observed in southern Utah were thought to be migratory, arriving each year in April to begin nesting (Behle 1941). In contrast, the adults of the Ironton colony located in central Utah were permanent residents in the area (Smith et al. 1974).

In central and northern Utah, at least, Barn Owls probably occupy a particular territory for a number of years, breeding whenever conditions are favorable and not breeding under suboptimum conditions. Observations suggest that young may occupy nearby areas when available or wander into new localities with the onset of colder weather. A given locality may be occupied continuously for a number of years and then abandoned for a time following the death of the adults.

Ecologically, Utah Barn Owls have been most commonly found in the settled valleys where they evidently find suitable roosting and foraging habitat. Although they may resort to the occasional use of natural cavities in trees and dry washes, they are usually found in association with man-modified habitats and structures. Furthermore, where natural roosting and nesting sites are used, the owls are frequently observed to utilize man-altered habitats for foraging. Utah Barn Owls are conspicuously absent from the western Great Basin Desert and mountainous areas. Their absence from the western desert areas may be due to a lack of suitable habitat but may also reflect an inability to compete there with the Great Horned Owl (*Bubo virginianus*), the predominant nocturnal raptor in that area. Their absence from higher elevations probably reflects their low tolerance of cold temperatures. Less explainable is their absence from the greater part of southeastern Utah where some habitat appears suitable.

Observations by Counties

A detailed survey of distribution by counties is presented here. In this discussion university specimen and egg collection references are abbreviated as follows: Brigham Young University, BYU; Dixie College, DC; Southern Utah State College, SUSC; University of Utah, UU; Weber State College, WSC.

Box Elder. Observations: Occasional visitor on the Bear River Migratory Bird Refuge since 1928. Regularly seen during winters of 1972 through 1975 (Beall letter of 11 March 1975); other observations on the refuge area as follows: one observed 2 November 1968 (Scott 1969); three died, apparently of cold and starvation, during winter of 1972-73 (Kingery 1973); one noted 15 February 1975 (Kingery 1975). Platt (1969) flushed three immatures from a dry wash near Snowville in July 1969. Specimens: one, undated, taken near Brigham City (D. H. Madsen); one, UU, a male, found dead in an emaciated condition 12 December 1972 on the Bear River Refuge. Nests: a set of fresh eggs was taken in May from an old barn near Brigham City (Treganza letter of 5 January 1930); Platt (1969) found a female road kill with brood patch near Snowville in June 1969; Beall (letter of 11 March 1975) reported a nest containing two eggs located in an old Raven (*Corvus corax*) nest on an observation tower on the Bear River Refuge in spring 1974.

Cache. Observations: two, both south of Logan; one August 1938 (Cottam) and one September 1938 (Rasmussen).

Weber. Observations: Marti located a roost approximately 15 miles west of Ogden in fall 1972. Specimens: one, WSC, sex unknown, taken in Slaterville in fall 1965; one, WSC, sex unknown, given by the Utah Division of Wildlife in winter 1972.

Davis. Specimens: one, UU, sex unknown, dated 19 December 1972, from New State Gun Club; one, UU, sex unknown, found 1 mile west of Interstate 80, 13 April 1971.

Salt Lake. Observations: one seen 25 December 1948, during the Audubon Christmas count; one observed in September 1954 (Scott 1955); numerous sightings as follows: one north of Salt Lake City 10 September 1967 (Scott 1968); two roosted in a cavity in a clay bank in Salt Lake City during 1970-71 winter (Scott 1971b); and one in Salt Lake City in April 1971 (Kingery 1971a). Nests: a pair reported to have nested near Draper for several years sometime prior to 1920 (Lockerbie 1954); reported nesting in Salt Lake Valley in spring 1967 (Scott 1967) and again in Salt Lake City in spring 1971 (Kingery 1971a).

Utah. Observations: numerous, dating from March 1928, when one was caught alive in Provo (Hayward, unpubl. manuscript); other observations and dates by Smith as follows: between one and three individuals regularly roosted in the Utah railroad roundhouse and water tower at Provo, from at least 1966 until these structures were dismantled in 1970; one to several roosted in the upper framework of the Springville drive-in theater screen from 1966 to the present; many roosted at the now dismantled Ironton Steel Mill from 1962 until it was demolished in 1970-71; regularly roosted in trees bordering the eastern edge of Utah Lake during falls and winters from 1966 to the present; occasionally seen in silos and old barns, less frequently in woods in the Orem, Springville, and Provo area from 1966 to the present. Specimens: five, all BYU, three from Springville, dated 9 March 1959 and (2) 25 January 1969; two from Provo, dated 19 October 1965 and 10 April 1967. Nests: UU has in its oological collection a clutch of seven eggs dated 7 June 1899 from American Fork, which constitutes the earliest record of Barn Owls in Utah; a set of fresh eggs taken about the middle of May from an old barn at Provo sometime prior to 1930 (Hayward, unpubl. manuscript); 15 nests from the Ironton Steel Mill colony, 1968-70, details in Smith et al. (1974); Frost reported a nest of five young about 1-3 weeks old in a poplar in American Fork 21 April 1971; the Utah Division of Wildlife reported a nest containing six young in an old barn in west Orem in late spring of 1973. The barn owner reported that the same site was used for nesting the previous spring.

Duchesne. Observations: Carlston reported seeing a pair in willows along Strawberry River about three miles west of Duchesne in July 1968.

Uintah. Observations: One reported by several residents near Jensen; one seen by Stewart in 1936; at Hill Creek, 40 miles south of Ouray, one was flushed from a hole in the face of a high cliff (Twomey 1942).

Sanpete. Nest: Tanner reported a pair nesting near Indianola years ago; no other data available.

Iron. Observations: One freshly killed was found under a tree near Paragonah, 2 October 1954 (Scott 1955); one seen at Cedar City 30 October 1968 (Scott 1969); also reported from Cedar Valley 9 September 1970 and 29 October 1970 (Scott 1971a); two recorded in county (one actually seen) during Audubon Christmas count 26 December 1970 in Cedar City and Parowan; reported in Cedar City 27 May 1971 and 3 June 1971 (Kingery 1971b). Specimens: four, two, UU, both taken near Parowan sometime prior to 1936 (Hayward, unpubl. manuscript); two SUSC, both taken near Cedar City one 4 January 1966; no other data given.

Kane. Observations: Investigations by Behle (1941) confirmed that Barn Owls utilized holes in banks of Kanab Wash, two miles south of Kanab, for roosting, Greenhalgh reported that these sites were used for many years and saw as many as 30 together at one time. Behle observed owls at this site 14 June 1939 and 10 to 12 June 1940. Specimens: four, all UU, Behle took three males in Kanab Wash, one mummy taken 14 June 1939, the other two 12 July 1940; one, a male, taken one mile south of Kanab 12 May 1946. Nests: Behle (1941) reported probable use of holes in Kanab Wash for nesting.

Washington. Observations: Tanner (1927) reported Barn Owls to be uncommon fall and winter residents in Zion Canyon; one reported near St. George, 19 April 1939 and 16 March 1940 (Hardy and Higgans 1940); two were seen in Zion Canyon in fall 1973, and Kingery (1974) noted that this is the first report of their occurrence in that area since 1941. Specimens: nine; seven from St. George and vicinity, earliest taken in March 1927 by Tanner (1927); one, no data, taken in April 1929 (Hayward, unpubl. manuscript); one, WSC, a female, taken 10 April 1939; one, DC, a female taken 30 June 1941; one, UU, a male taken from a family group 11 September 1941, two miles south of St. George; one, DC, a female, taken 4 May 1948; one, UU, wing only, found five miles southeast of St. George 28 December 1960; one, DC, no details, taken near Beaver Dam Wash; one, no details, BYU, taken near Bloomington 15 November 1933. Nests: a nest containing two young was observed in a cliff about three miles southeast of St. George across the Virgin River (Hayward, unpubl. manuscript); Behle (1943) reported a family group of four birds roosting 20 feet high in a dense willow thicket two miles south of St. George 8 to 10 September 1941.

Reproductive Activities

We have information on 23 Barn Owl nests in Utah. Fifteen of these were located at the Ironton Steel Mill, Utah County, and are discussed in detail by Smith et al. (1974).

Breeding Chronology. The discovery of Barn Owls nesting in fall 1968 (Smith et al. 1970) suggests that Utah Barn Owls may breed at any time of the year if conditions are favorable. The length of the 1969 nesting season, as judged from the time of deposition of the first clutch until the fledging of the last brood, was 5.75 months, a figure very close to the similarly determined 5.3-month nesting season found in southern Texas (Otteni et al. 1972). As judged by information on eggs, young, or both, 18 were spring nests (February to May), 3 were summer nests (June to August), and 2 were fall nests (September to December). Eggs were deposited in spring nests in February and March and occasionally as late as early April. Young were found from late March through May and had usually fledged in late May or

early June. Summer nests contained eggs from early May through June, and young usually fledged by August. Fall nests contained eggs in September and early October, and the young usually fledged in late November and early December.

Nests. None of the pairs we observed made any attempt at nest construction. Instead, nests consisted of a mixture of broken pellets and fecal material, with a slightly hollowed central cavity in which the eggs were deposited.

Most nests were located in man-made structures. All 15 nests at Ironton were in the buildings and associated structures of the abandoned steel mill. Elsewhere, four nests were found in old barns, one in a silo, and one in an observation tower on the Bear River Migratory Bird Refuge (Beall, letter of 11 March 1975). The use of natural sites has been reported primarily from the southern part of the state. Behle (1941) confirmed that Barn Owls nested in cavities in Kanab Wash, Kane County, and also reported a nest located in a cavity in a cliff south of St. George, Washington County. Use of hollow trees for nesting sites has been reported from the central portion of the state; Frost banded four young in a nest located in a poplar in American Fork, Utah County.

Reproduction. Clutch size averaged 4.4 ± 0.9 eggs (range, 2 to 9). Two clutches were of two eggs; three of three; three of four; four of five; two of six; two of seven; and one of nine eggs. Brood sizes averaged 3.47 ± 0.22 young (range, 2 to 5). Five nests contained two young; two contained three; four contained four; and one contained five young. Both egg and brood size averages are within the ranges reported from other areas. Ten nests that fledged young averaged 1.95 young fledged per nest (i.e., 1.95 young per successful nest). It is of interest to note that the Barn Owl fledging rate for the state is significantly higher than that in the Ironton Steel Mill colony (1.3 young fledged per nest) although no obvious reason can be advanced to explain the difference.

Nesting Failures. Only 10 of the 20 nests for which we have sufficient information successfully fledged at least one young. Known reasons for the nesting failures included nest desertion, destruction of eggs, and death of the adults. Seven nests were deserted; in some cases, human interference was a probable cause. Three of these nests, however, were deserted during brief periods of cold February weather, and the potential effects of the cold weather on the adults must be considered as a possible factor. A similar desertion was observed by Marti (1969) in Colorado following an unusual April snowstorm. The eggs of one nest were destroyed by unknown persons, and the two young of another nest disappeared shortly after the adults were shot.

Food and Feeding Habits

Barn Owls are among the most nocturnal of the owls found in Utah; those we observed typically hunted during twilight and darkness from shortly after sunset until shortly before the first light of dawn. We did, however, observe some instances of diurnal hunting. Factors which appeared to prompt diurnal hunting included inclement weather (particularly extended periods of rain or snow), a persistent snow cover, and large broods of young. Observations of specific individuals by the senior author suggest that diurnal hunting represents an extension of the duration of the hunting period rather than a change in actual diel activity. That is, hunting by Barn Owls is a function of their individual food procurement requirements and difficulties. They compensate for poor conditions by hunting longer.

Data on the seasonal food habits of Utah Barn Owls have been presented by Smith et al. (1972). In this report our discussion is limited to summary material and new analyses. We obtained information on Barn Owl food habits from an analysis of 941 pellets and pellet fragments which were collected from 1968 to 1972, and a tabulation of food items brought to five nests located in the Ironton Steel Mill, Utah County.

Food habits of adult Barn Owls are presented in table 1. The majority of pellets were collected from several roosting sites found in the vicinity of Provo and Springville, Utah County. Habitats in these areas varied considerably and included farms, pastures, marshes, cemeteries, vacant lots, and suburban and industrial sectors. A second collection of pellets was from Box Elder County, about 15 miles west of Corrine (contributed by J. B. Platt). Habitat in this vicinity was predominantly desert scrub with some farmland and a small marsh.

Pellet analysis followed methods described by Marti (1974). Vertebrate prey remains were identified by comparison with mammal and avian specimens in the Brigham Young University and Weber State College collections.

Collectively, we recorded a total of 3,182 food items of Utah Barn Owls. They included at least twelve species each of birds and mammals and two species of insects. Of these, mammals, primarily *Microtus* spp. and *Peromyscus* spp., were the most important, comprising over 90 percent of the total prey. Birds and insects were utilized far less frequently, especially in Box Elder County. The differences in food between the two areas undoubtedly reflected the availability of local prey species.

Comparison with numerous Barn Owl food habits studies from other areas of the United States reveals similarities and differences which again undoubtedly reflect locally abundant prey species. Almost all show a high incidence of predation on small mammals. However, Boyd and Shriner (1954) found a higher percentage of Starlings (*Sturnus vulgaris*) and House Sparrows (*Passer domesticus*) in the pellets of Barn Owls roosting in the center of a city than from those in outlying roosting sites, a discovery which closely parallels that of food habits of the Barn Owls in Utah County.

Food of Nestling Barn Owls. Information on food brought to nestling Barn Owls is presented in table 2. It was obtained from observations of food brought to the young of five nests located in Utah County during the 1969 spring nesting season. Food brought to the nest before the young had hatched represented food stockpiling and was found at every nest. Generally, the foods listed for weeks 5-12 of the nesting cycle were recorded during observations of the young from blinds because, except during the first two weeks, food was rarely found in the nest after the young had hatched and grown sufficiently to feed themselves. It is readily evident that the diet of nestling Barn Owls quite closely resembles that of the adults.

Diversity of Barn Owl Food Habits. The wide variety of prey found in the diet of the Utah County Barn Owls prompted an examination of the diversity of food selection in different areas. The results are presented in table 3. Comparative studies were selected to allow a variety of localities but included only studies based on a minimum of 500 or more food items, a number which should give an unbiased food sample size. Several European studies have been conducted over 20 or more years and represent a more exhaustive treatment than anything yet available from North America.

Diversity indices were calculated using the commonly accepted modification of the Shannon-Weaver formula as given in Orr et al. (1973):

$$H = -\sum_{i=1}^{s} P_i \log_{10} P_i$$

where s is the number of species and p_i is the proportion of the number of individuals in the i^{th} species. Two indices were caluculated for each locality: the Prey Species Diversity (PSD) index indicates the range and evenness of Barn Owl predation on all organisms taken as food.

The Trophic Diversity (TD) index provides some indication of the range of Barn Owl predation over major taxonomic groups and gives a measure of its niche breadth. Several interesting facts are revealed in table 3. First, the PSD of Barn Owls shows considerable variation throughout their range, thus confirming their ability to take locally abundant prey species. Second, the PSD of Utah Barn Owls falls within the range of recorded values observed in other areas of North America and Europe. The greater PSD of Barn Owls in Box Elder County compared to Utah County may be explained by the fact that the PSD is a measure of both richness and evenness; therefore, the more equal predation on the variety of small rodents in Box Elder County resulted in a higher PSD. Of considerable interest is the TD of Utah County Barn Owls, which ranks among the highest yet recorded. It reflects the diversity of habitats and fauna in Utah County and, more importantly, the ability of the Barn Owls to adjust their hunting habits to suit local conditions.

Mortality of Adults

Causes of mortality of adult Barn Owls in Utah included collision with automobiles, shooting, accidents, and severe winter weather. Six adults were collected as road kills, all from along major interstate highways in the central and northern parts of the state. This form of mortality may be of far greater significance than records indicate. Trost (pers. comm.) noted that one of his students picked up 35 dead Barn Owls in one day along the interstate highway between Pocatello and Jerome, Idaho. Two Barn Owls were shot at the Ironton Steel Mill, and several have been observed in taxidermy shops, indicating a high probability that Barn Owls are occasionally shot for sport and perhaps also as vermin. Observed accidental causes of mortality were limited and involved the entrapment of four Barn Owls in a structure at the Ironton Steel Mill (Smith and Murphy 1972). At least four Barn Owls died during severe winter weather conditions, and scattered reports indicate several more perished in recent winters. All reports are from the central and northern counties. One adult male was found dead in a silo about two miles west of Springville, Utah County, on 10 January 1971 in a very emaciated condition, with its stomach empty. Three individuals died at Bear River Migratory Bird Refuge in December 1972 (Kingery 1973; Beal letter of 11 March 1975), and one of them was reported in an emaciated condition. Winter mortality of Barn Owls is a familiar phenomenon and has been reported from a number of northern localities in the United States and Europe (Henny 1969). Winter mortality has been ascribed to cold temperatures and starvation. Smith et al. (1972) found a decline in the number of food items per pellet during periods of cold and snow cover, although none of the owls under observation died. It is, however, very probable that winter weather conditions constitute a potential source of mortality of Barn Owls throughout the northern portions of Utah.

Discussion

Analysis of available information indicates the presence of a substantial Barn Owl population in central and northern Utah. A somewhat smaller and perhaps more transient population is in the southwestern corner of the state. The known breeding records suggest that the northern population, at least, is currently maintaining its numbers, but this may be only a temporary situation brought about by the chance occurrence of sizeable prey populations and sufficient suitable nesting and roosting sites. Indeed, we are unwilling to predict the continued success of this species in northern Utah because of its poor adaptiveness to rigorous winter climates.

While undoubtedly having contributed indirectly to the benefit of the Barn Owl population through some types of habitat modification and building construction, man poses a continued threat to this owl both purposely, through shooting, and accidentally, by automobile collision. Other factors which may act to limit the distribution and success of Barn Owls in Utah include possible competition from other nocturnal raptors, such as the Great Horned Owl, and winter weather. Our food habits studies indicate that suitable food is available and is not therefore a limiting factor. Instead, Barn Owls, as with most species of raptors, are opportunistic in prey selection and have sufficient hunting ability to obtain food in many of the diverse habitats found in Utah.

Continued observation of this population should elucidate further the role of Barn Owls in the natural and man-modified habitats of the intermountain area.

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TABLE 1

TOTAL PREY IDENTIFIED FOR BARN OWLS IN UTAH

Prey Species	*Utah County*		*Box Elder County*	
	Number	Percent Frequency	Number	Percent Frequency
Mammals				
Microtus pennsylvanicus	2,345	78.1	23	12.9
Microtus montanus	–	–	24	13.4
Mus musculus	156	5.2	–	–
Phenacomys intermedius	35	1.2	–	–
Peromyscus spp.	13	0.4	76	42.7
Peromyscus maniculatus	98	3.3	–	–
Sorex spp.	3	0.1	2	1.1
Sorex vagrans	31	1.0	–	–
Perognathus spp.	–	–	15	8.4
Reithrodontomys megalotis	–	–	33	18.5
Dipodomys ordii	–	–	2	1.1
Sylvilagus spp.	1	tr.	2	1.1
Sylvilagus audubonii	3	0.1	–	–
Rattus norvegicus	23	0.8	–	–
Birds				
Sturnus vulgaris	169	5.6	–	–
Passer domesticus	53	1.8	–	–
Columba livia	7	0.2	–	–
Agelaius phoeniceus	21	0.7	–	–
Falco sparverius	1	tr.	–	–
Molothrus ater	2	0.1	–	–
Fulica americana	2	0.1	–	–
Colaptes auratus	5	0.2	–	–
Totanus flavipes	1	tr.	–	–
Turdus migratorius	7	0.2	–	–
Riparia riparia	2	0.1	–	–
Lophortyx californicus	1	tr.	–	–
Unidentified birds	18	0.6	1	0.6
Invertebrates				
Carabidae	2	0.1	–	–
Tenebrionidae	1	tr.	–	–
Unident. Coleopterans	4	0.1	–	–
Totals	3,004	100.0	178	100.0

TABLE 2

FOOD BROUGHT TO BARN OWL NESTS CONTAINING EGGS AND YOUNG (Data pooled from five nests)

Week of Nesting Cycle	PREY													
	Microtus spp.		*Peromyscus* spp.		*Mus* Musculus		*Sorex* spp.		Starlings		House Sparrows		Icterids	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Eggs in nest														
1	16	6.2	3	1.2	–	–	1	0.4	–	–	–	–	–	–
2	7	2.7	–	–	1	0.4	–	–	–	–	1	0.4	–	–
3	7	2.7	3	1.2	3	1.2	–	–	–	–	–	–	–	–
4	6	2.3	1	0.4	1	0.4	1	0.4	–	–	1	0.4	–	–
Young in nest														
5	25	9.6	7	2.7	1	0.4	–	–	2	0.8	1	0.4	–	–
6	19	7.3	3	1.2	–	–	3	1.2	–	–	–	–	–	–
7	37	14.2	1	0.4	4	1.5	1	0.4	–	–	–	–	1	0.4
8	31	11.9	5	1.9	5	1.9	–	–	3	1.2	1	0.4	1	0.4
9	14	5.4	5	1.9	2	0.8	2	0.8	1	0.4	–	–	1	0.4
10	9	3.5	1	0.4	–	–	2	0.8	6	2.3	3	1.2	–	–
11	6	2.3	–	–	–	–	–	–	–	–	1	0.4	–	–
12	2	0.8	1	0.4	–	–	–	–	1	0.4	–	–	–	–
Totals	179	68.9	30	11.7	17	6.6	10	4.0	13	5.1	8	3.2	3	1.2

TABLE 3

DIVERSITY INDICES OF BARN OWL PREDATION CALCULATED FOR UTAH AND OTHER SELECTED LOCALITIES

Location	No. Prey Indiv.	No. Prey Species		Trophic Diversity	Prey Species Diversity	Source
		Birds	Mammals			
Utah						
Box Elder Co.	178	1	8	0.03	2.31	This study
Utah Co.	3,004	12	12	0.48	1.45	This study
California	933	10	13	0.27	2.19	Selleck & Glading 1943
Colorado	4,366	6	16	0.10	2.76	Marti 1974
Michigan	6,815	5	13	0.07	0.98	Wallace 1948
Pennsylvania	6,175	7	17	0.03	1.46	Latham 1950
Texas	11,408	6+	10	0.66	3.35	Otteni et al. 1972
Germany	76,664	51	32	0.19	2.69	Uttendorfer 1952
England	47,865	8+	17	0.13	2.29	Glue 1974

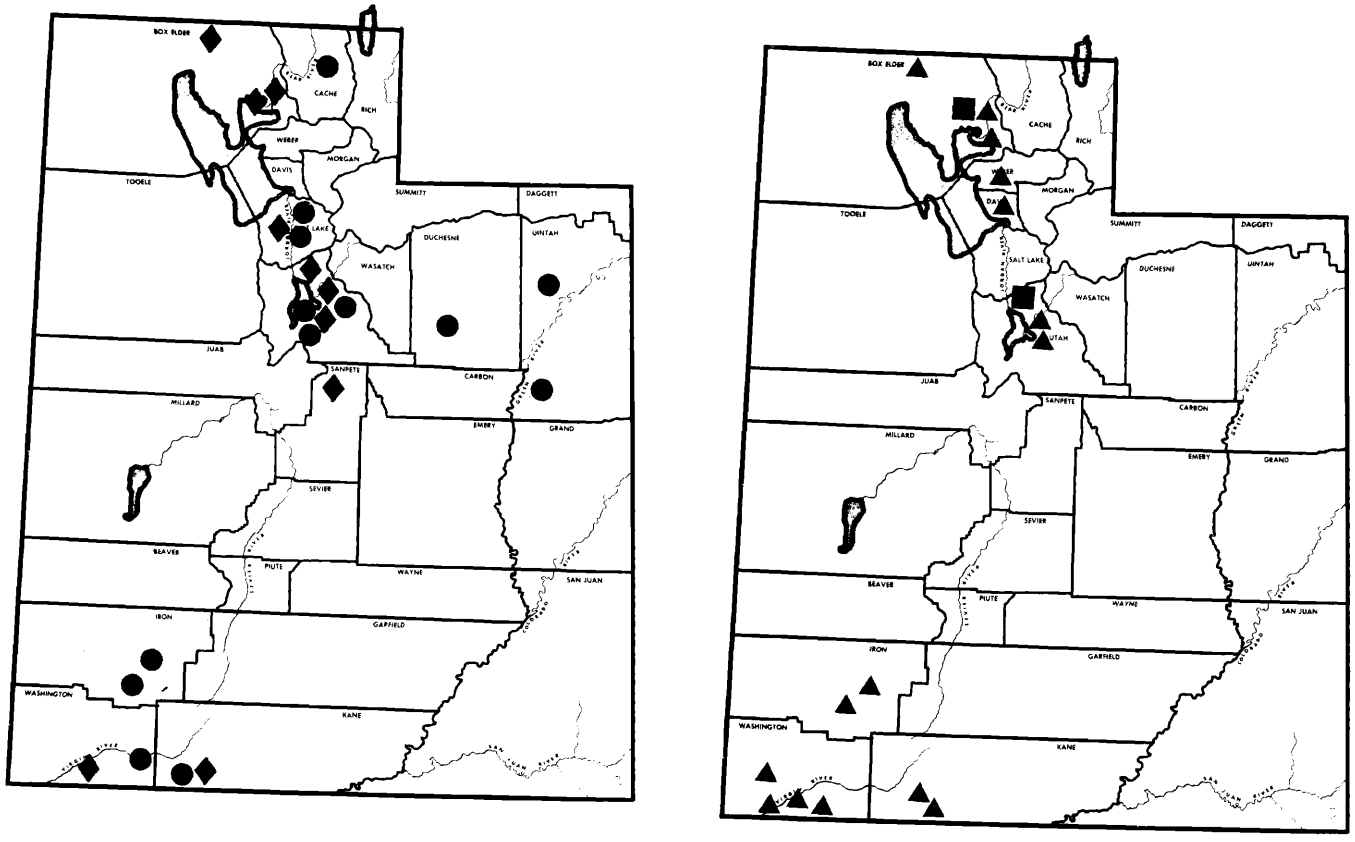

Figure 1. Distributional records of Barn Owls in Utah by observation, nesting sites, and specimen and egg collection locales. Locations shown are approximate.