Bird Life, Univ. South Carolina Press, Columbia, South Carolina, 1949), and in barns (Pickens, Auk 44:573–574, 1927; Tyler, pp. 12–28 *in* Bent's Life Histories of North American Birds of Prey, Pt. 1, Dover Publ., New York, New York, 1961). Sample sizes were small or not mentioned by these authors.

In southeastern Illinois, Turkey Vultures were found commonly nesting in abandoned structures. From 1978–1983, 15 nests were observed and four others were reported by local farmers in the area. The 19 nests were situated in eight different barns, two old houses, and an old storage shed. No Turkey Vulture nests were discovered in natural sites during the 5-year period, but no intensive search for such nests was made. However, selection of abandoned buildings was evident as 70% of the structures checked during the study had nests. The decline in use of natural cavities for nest-sites by Turkey Vultures (Jackson 1983) may be related to this seeming shift by vultures to nest-sites in abandoned buildings.

All buildings were in or at the edge of wooded areas; all were abandoned except for the storage of farm equipment in some of the barns; and none was closer than 80 m to the nearest homestead. All 16 nests found in barns were in hay lofts. In the houses, one nest was on a first floor, and the other was on a second floor. The nest in the shed was on the ground.

Nests had been placed in dark corners of the building or in cavities created by spaces between bales of hay. Jackson (1983:264) also noted that Turkey Vulture nest-sites were typically in "dark recesses." Nest substrates consisted of wheat straw (N = 15), wood (N = 2), corn stalks (N = 1), and rotten wood (N = 1).

The history of two nests found in our survey was followed from initiation to fledging. The first eggs were layed on 29 April and 8 May, and hatched on 3 June and 11 June, respectively. Fledging occurred approximately 81 and 66 days later. One other nest contained one egg on 2 May, but was found destroyed 10 days later.

Fourteen of the 19 nests were successful, four were destroyed by predators, and one was destroyed when one of the houses was demolished. Nest destruction occurred only during egg-laying (N = 1) or incubation (N = 4). The nest success of 79.2% was higher than the 53.3% reported by Jackson (1983:262). Turkey Vulture eggs and nestlings in nests placed on the ground in thickets have higher mortality rates compared to nests above the ground (Jackson 1983). Since most of the nests in our study were in barn lofts, the nest success could be greater than in ground nests because predators such as coyotes (*Canis latrans*), red foxes (*Vulpes fulva*), and domestic dogs (*C. familiaris*) could not reach them.

Each completed nest contained two eggs. Of the 28 eggs of known fertility two were judged infertile when opened. In one barn, single nests over 5 consecutive years fledged a total of nine young.

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Nesting distribution and reproductive status of Ospreys along the upper Missouri River, Montana.—The enhancement and expansion of Osprey (*Pandion haliaetus*) habitat as a result of the construction of reservoirs has been noted in a number of sites in the western United States (Roberts and Lind, pp. 215–222 *in* Trans. N. Am. Osprey Resear. Conf., U.S. D. I., Natl. Park Serv., Trans. and Proc. Ser. No. 2, 1977; Henny et al., Northwest Sci. 52:

TABLE 1
SUMMARY OF OSPREY PRODUCTIVITY, UPPER MISSOURI RIVER

	1981	1982
No. occupied nests	38	45
No. active nests	29	36
No. advanced young	50	43
No. successful nests	22	21
No. advanced young/active nest	1.72	1.19
No. advanced young/occupied nest	1.32	0.96

261–271, 1978; Swenson, Western Birds 12:47–51, 1981). Here, I report on Osprey nesting along the upper Missouri River and compare nesting density on free-flowing and impounded portions of the river. As the two habitats abut one another and were studied concurrently, differences due to climate were minimal.

Study area and methods.—The area studied was in southwestern Montana, beginning at the headwaters of the Missouri River and ending approximately 190 km north at Holter Dam. The study area was divided into four segments: the free-flowing segment and three reservoir segments—Canyon Ferry Reservoir, Hauser Lake, and Holter Reservoir.

Nesting terminology follows that of Postupalsky (pp. 1–11 *in* Trans. of the N. Am. Osprey Resear. Conf., U.S.D.I., Natl. Park Serv., Trans. and Proc. Ser. No. 2, 1977) in which occupied nests are defined as nests that have a mated pair of Ospreys associated with them. An active nest is a nest that has had at least one egg laid in it. In this study a nesting attempt was considered successful if at least one young was raised to an advanced stage of development, i.e., at least to within 1 week of fledging. Seven aerial surveys were conducted over the 2 years of the study to locate occupied nests and to determine the productivity of the population. Dates of the flights were: 4 May, 22 June, and 31 July 1981; 15 May, 4 June, and 8 and 29 July 1982. Information from aerial surveys was supplemented by ground observations. Lengths of the reservoirs were estimated as the length of the river prior to impoundment. This method allowed for a measure of the impact of reservoir formation on nesting distribution, as one river segment was not impounded. Families of fishes taken as prey were determined by collecting the cleithra (external and adjacent to the clavicle) and

TABLE 2
NESTING DENSITIES AND DISTRIBUTION OF OSPREYS, UPPER MISSOURI RIVER, 1981–1982

Study area segment	Nest density (occupied nests/km)[a]	Mean no. occupied nests/year (%)
River	0.03	2.0 (4.8)
Canyon Ferry	0.41	26.0 (62.7)
Hauser	0.12	3.0 (7.2)
Holter	0.26	10.5 (25.3)
Total	0.22	41.5 (100.0)

[a] One by two contingency tables showed significant differences in occupied nests/100 km between the river and each of the reservoirs (all $P < 0.025$).

TABLE 3

NUMBER OF CLEITHRA AND OPERCLES COLLECTED FROM BELOW OSPREY NESTS AND FEEDING PERCHES ON THREE STUDY AREA SEGMENTS, UPPER MISSOURI RIVER, 1981–1982[a]

Family	Study area segment		
	River	Canyon Ferry	Holter
Sucker (Catostomidae)	155 (70)[b]	1710 (74)	702 (72)
Minnow (Cyprinidae)	42 (19)	107 (5)	51 (5)
Perch (Percidae)	1 (<1)	429 (18)	126 (13)
Trout (Salmonidae)	22 (10)	79 (3)	93 (10)
Total	220 (99)	2325 (100)	972 (100)

[a] Two by four contingency tables showed a significant difference between the river segment percentages and the Canyon Ferry percentages ($\chi^2 = 30.0$, df = 3, $P < 0.005$) and between the river and Holter ($\chi^2 = 21.2$, df = 3, $P < 0.005$) but not between Canyon Ferry and Holter ($\chi^2 = 4.62$, df = 3, $P = 0.21$).

[b] Percent of total.

opercles (large posterior bone of the gill cover) found below feeding perches and nests. Collected bones were then compared to a reference collection for family identification. Although the use of bones for determing food habits of Ospreys can be misleading (heavier boned fish tend to be overrepresented), their use for the purpose of detecting differences in diets should be valid.

Results and discussion.—The productivity of Ospreys in this study (Table 1) compares favorably with other western United States populations: 1.27 young per occupied nest in Idaho (Van Daele and Van Daele, Condor 84:292–299, 1982) and 0.60 young per occupied nest on Yellowstone Lake, Wyoming (Swenson, J. Wildl. Manage. 43:595–601, 1979).

The establishment of reservoirs appears to have increased nesting densities. The number of occupied nests per kilometer of river was significantly higher on the reservoirs than on the free-flowing segment of the river (Table 2). Newton (Can. Field-Nat. 90:274–300, 1976) stated that nest-sites and food are the chief factors governing the density of breeding raptors. My observations indicate that nest-sites are not limiting the distribution of Ospreys on the upper Missouri River (Grover, M.S. thesis, Montana State Univ., Bozeman, Montana, 1983). Table 3 depicts differences in the relative use of prey on three river segments. Perch were taken more often and minnows less often on the reservoir portions of the study area. These differences reflect changes in the prey species composition, changes in the prey species availability, or both, resulting from reservoir formation. These changes may then be making the reservoirs a more desirable nesting habitat by allowing the birds to more easily meet their energy demands.

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