

- PETTINGILL, O. S., JR. 1971. Ornithology in laboratory and field, 4th Ed. Burgess Publ. Co., Minneapolis.
- ROSENBERRY, J. L., AND W. D. KLIMSTRA. 1970. The nesting ecology and reproductive performance of the Eastern Meadowlark. *Wilson Bull.* 82:243-267.
- RYDER, J. P. 1975. Egg-laying, egg size and success in relation to immature-mature plumage of Ring-billed Gulls. *Wilson Bull.* 87:534-542.
- SAUNDERS, G. B. 1932. A taxonomic revision of the meadowlarks of the genus *Sturnella* (Vieillot) and natural history of the Eastern Meadowlark, *Sturnella magna magna* (Linnaeus). Ph.D. diss., Cornell University.
- STODDARD, H. L. 1936. The Bobwhite Quail—its habits, preservation and increase. Chas. Scribner's Sons, New York, N. Y.
- TINBERGEN, N. 1960. The Herring Gull's world. New York, Basic Books.

Department of Biology, Lakehead University, Thunder Bay, Ontario P7B 5E1 Canada. Accepted for publication 20 November 1975.

FURTHER BIRD RECORDS FROM WESTERN MONTANA

PHILIP L. WRIGHT

The following records add three species to the list of Montana birds, add three species and one subspecies to those known to occur west of the continental divide in the state, and extend the known breeding range of one species. Another record fully authenticates the occurrence within the state of another species previously known only from an unspecified specimen. All of these changes are based upon specimens in the University of Montana Zoological Museum (UMZM). One species must be dropped from the Montana list and another relegated to hypothetical status.

Aythya marilla. Greater Scaup. An immature female was shot by T. France 7 km west of Ronan, Lake County on 13 October 1975 (UMZM 15957). Although there are several sight records by experienced observers during fall, winter, and spring from various localities within the state, both the locality and the date of collection of the only previous specimen (Hoffmann and Hand 1962) were uncertain.

Bucephala clangula. Common Goldeneye. In late April of 1973, Calvin Pomrenke and Clark Smith discovered an active goldeneye nest in an artificial nest box on the Ravalli National Wildlife Refuge, Ravalli County. The incubating female was later killed by a mink and the skeleton and 8 of the 11 eggs in the clutch were recovered on 26 May. The skeleton proved to be that of *B. clangula* (UMZM 15661). This record extends the known breeding range of this species about 257 kilometers southward from near Fortine, Lincoln County, where it nests commonly (Weydemeyer 1973). Silloway (1901, 1903) described *B. clangula* as a common nesting duck in Lake and Flathead counties, but the 5 juvenile goldeneyes which he collected in 1900 and 1902 from these areas now in the UMZM are all *B. islandica*. It now seems likely that the goldeneye broods he reported with attending females were all Barrow's, which species is known to nest as far south in the Rockies as Colorado (AOU 1957).

Buteo jamaicensis harlani. Harlan's Red-tailed Hawk. A dark phase *Buteo* was recovered by Robert Cheeseman from a muskrat trap 2 km east of Florence, Ravalli County on 13 December 1968. John Aldrich (*in lit.*) examined color slides of the specimen (UMZM 13761) and agreed that it was

of this subspecies. Although *harlani* nests in northern British Columbia, it typically migrates east of the Rockies. There are several sight records from eastern and central Montana (Skaar *in lit.*), but this constitutes the first specimen from Montana and the first record from western Montana.

Larus occidentalis. Western Gull. Silloway (1903) reported a juvenile gull collected at the mouth of the Flathead River, Bigfork, Flathead County 29 August 1900 as "doubtfully" belonging to this species. Saunders (1921) repeated the record and indicated that he too believed this specimen (UMZM 5821) to be *L. occidentalis*. Although both feet and legs are now missing, the specimen is otherwise in good condition. Frank Richardson, at the University of Washington, recently compared it to known specimens of *L. occidentalis* and agreed with me that this bird is not *L. occidentalis*. Richardson believes the specimen to be that of *L. californicus* which was also collected by Silloway in 1900. Measurements of the wing and culmen correspond to those provided by Dwight (1925) for *L. californicus*. Because there is no other specimen of Western Gull from Montana and no convincing sight records, this species should be dropped from the list of Montana Birds.

Otus flammeolus. Flammulated Owl. In October 1971 the LeRoy Sargent family of Darby, Ravalli County picked up a live Flammulated Owl near the game farm at that town and brought it to William L. Jellison. The owl eventually died and Jellison prepared a study skin, which he donated to the Museum (UMZM 15231). The abundance of House Sparrows (*Passer domesticus*) at the game farm may have attracted the bird to this area. This west coast and southwestern species is rare in southern British Columbia (AOU 1957) and there are two records for Idaho (Burleigh 1972). Two previous sight records exist for Montana, (Skaar, *in lit.*) but this is the first specimen record for the state.

Strix occidentalis. Spotted Owl. Hoffmann, Hand, and Wright (1959) published a record of this species based on a monochrome photograph taken by Vernon Hawley at Anaconda Creek, Glacier National Park in the summer of 1953. The Barred Owl (*Strix varia*) now occurs regularly in several areas of the western part of Glacier National Park (Shea 1974), and has recently invaded southeastern British Columbia (Grant 1966). There are no convincing records of *S. occidentalis* during the past 20 years from western Montana. These facts prompted a re-study of the original photo and comparison with specimens of both species now in the UMZM collection. The photo shows a large owl with rounded

head and dark eyes, but the markings on the lower breast and abdomen are very indistinct. Several other ornithologists have examined the picture and they as well as Hoffmann, Hand, and Wright, now agree that it is more likely of *Strix varia*. The only record of the Spotted Owl from Montana (Weydemeyer 1927) is based on a sighting by Winton and Donald Weydemeyer, who observed one at close range several kilometers west of the above site in Flathead County, on 10 August 1922, but provided no detail. There being no specimen or convincing photograph, this species should be placed on the hypothetical list of Montana birds.

Calypte anna. Anna's Hummingbird. A juvenile male in first prebasic molt was picked up alive on the University of Montana campus on 16 November 1969 by Harry Reynolds. An effort was made to feed the bird sugar solution but it died within a few hours. Numerous rose red feathers show in the crown as well as in the gorget. The remiges and rectrices appear to be completely molted and are comparable to those from a spring adult male in the collection taken in California. The bird weighed 3.4 g, the skull was only partly ossified, and the testes were minute. This specimen (UMZM 14077) apparently constitutes the first record for the state.

There are many recent records of this species from areas inland from the usual coastal range particularly in the fall and winter (Zimmerman 1973). None of these records is more striking than this one. Calliope (*Stellula calliope*) and Rufous (*Selasphorus rufus*) hummingbirds are common around Missoula during late spring and summer but are generally gone by early September. The latest hummingbird record for the state was previously that of a Rufous Hummingbird in the Missoula area on 16 September, and feeders would not be available in November. It does not seem possible that this bird could have been accidentally carried in on a vehicle and still be able to fly weakly when discovered.

Catherpes mexicanus. Canon Wren. Two juveniles, a male and a female, were collected from a family group of 5 or 6 at Lake MacDonald, Lake County by J. David Ligon on 26 June 1968. Probably these young (UMZM 13445 and 13448) were from a brood recently fledged in the vicinity. This species was recorded as breeding in south central Montana by Skaar (1969). Although there are now several sight records from western Montana, these constitute the first specimens obtained in western Montana.

Pheucticus ludovicianus. Rose-breasted Grosbeak. A male in second prebasic molt was picked up dead by William L. Jellison on a city street in Hamilton, Ravalli County on 23 September 1970. Although this species regularly migrates through eastern Montana and occurs rarely in the late spring in central Montana, this specimen (UMZM 14705) constitutes the first record for western Montana.

Carpodacus purpureus. Purple Finch. An unusually heavy crop of Ponderosa Pine (*Pinus ponderosa*) cones in the summer of 1974 attracted and held large numbers of Cassin's Finches (*Carpodacus cassinii*) in the Missoula area during the winter of 1974-75. Among a flock of approximately 100 birds was a male *C. purpureus*, which was first seen on 17 February at a feeder at my home among pines 4 km north of Missoula. Because the specific and subspecific identity was uncertain from photographs, I collected the bird on 26 March 1975. The speci-

men (UMZM 15844) is largely in definitive plumage but has a number of first basic feathers on the rump, flanks, and sides. Comparison of the measurements of the specimen with those presented in Ridgway (1901) and the fact that the rump is much brighter than the back indicate that the bird is *C. p. purpureus*.

This bird was shorter, stockier, and slightly darker red than adult males of the numerous *cassinii*, but the most striking field character was a white mid-abdominal stripe, not seen on any adult male *cassinii*. Although I observed well over 100 and perhaps several hundred *Carpodacus* finches at close range near my home during February and March, no other individuals appeared to be *purpureus*.

The breeding range of this species in Alberta extends to within 160 km of Montana (Salt 1952). Alberta birds apparently migrate southeastward and do not occur in Montana in numbers. There are, however, several sight records from central and eastern Montana (Skaar, *in lit.*), some by reliable observers. A female Purple Finch was mist-netted and banded at Medicine Lake National Wildlife Refuge in northeastern Montana in April 1968. The Missoula specimen constitutes the first record for western Montana and the first specimen record for the state.

Junco caniceps. Grey-headed Junco. Among a flock of about 100 *Junco hyemalis* of several subspecies, an adult male *J. caniceps* appeared at my house on 10 January 1975. It continued to be seen until 9 February when I collected it. The specimen (UMZM 15843) matches Miller's (1941) criteria for *J. c. caniceps*. A male of this subspecies was collected at Glendive, Dawson County in extreme eastern Montana on 5 May 1916 (Duvall 1945), and there is a sight record of this species from Red Rock Lakes National Wildlife Refuge, Beaverhead County, in south central Montana on 14 April 1972 (Rogers 1972). The present specimen constitutes the second from Montana and the first record from western Montana.

I thank William L. Jellison for donating two of these specimens and P. D. Skaar for help with records of several of these species.

LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION. 1957. Checklist of North American Birds. Fifth ed. Am. Ornithol. Union, Baltimore.
- BURLEIGH, T. D. 1972. Birds of Idaho. Caxton Printers, Caldwell, Idaho.
- DUVALL, A. J. 1945. Random distributional records. *Auk* 62:626-629.
- DWIGHT, J. 1925. The gulls (Laridae) of the world; their plumages, moults, variation, relationships and distribution. *Bull. Am. Mus. Nat. Hist.* 52:63-401.
- GRANT, J. 1966. The Barred Owl in British Columbia. *Murrelet* 47:39-44.
- HOFFMANN, R. S., R. L. HAND. 1962. Additional notes on Montana birds. *Murrelet* 43:29-35.
- HOFFMANN, R. S., R. L. HAND, AND P. L. WRIGHT. 1959. Recent bird records from western Montana. *Condor* 61:147-151.
- MILLER, A. H. 1941. Speciation in the avian Genus *Junco*. Univ. California Publ. Zool. 44:173-434.
- RIDGWAY, R. 1901. The Birds of North and Middle America. Part I. *Bull. U.S. Nat. Mus.* 50.

- ROGERS, T. H., JR. 1972. Northern Rocky Mountain-Intermountain Regions. *Am. Birds* 26:783-787.
- SALT, G. W. 1952. The relation of metabolism to climate and distribution in three finches of the genus *Carpodacus*. *Ecol. Monogr.* 22:121-152.
- SAUNDERS, A. A. 1921. A distributional list of the birds of Montana. *Pacific Coast Avifauna*. No. 14.
- SHEA, D. S. 1974. Barred Owl records in western Montana. *Condor* 76:222.
- SILLOWAY, P. M. 1901. Summer birds of Flathead Lake. *Bull. Univ. Montana* No. 3. *Biol. Ser.* No. 1.
- SILLOWAY, P. M. 1903. Additional notes to summer birds of Flathead Lake, with reference to Swan Lake. *Bull. Univ. Montana* No. 18. *Biol. Ser.* No. 6.
- SKAAR, P. D. 1969. Birds of the Bozeman latilong. P. D. Skaar, Bozeman, Montana.
- WEYDEMEYER, W. 1927. Some new birds from western Montana. *Condor* 39:159.
- WEYDEMEYER, W. 1973. The spring migration pattern at Fortine, Montana. *Condor* 75:400-413.
- ZIMMERMAN, D. A. 1973. Range expansion of Anna's Hummingbird. *Am. Birds* 27:827-835.

Department of Zoology, University of Montana, Missoula, Montana 59801. Accepted for publication 15 July 1975.

COMMENTS ON FEEDING HABITS AND VULTURE-MIMICRY IN THE ZONE-TAILED HAWK

DALE A. ZIMMERMAN

That the Zone-tailed Hawk (*Buteo albonotatus*) is an aggressive mimic of the Turkey Vulture (*Cathartes aura*) has been convincingly suggested by Willis (Condor 65:313-317, 1963). Essential to this thesis is the conditioning of vertebrate prey to the benign presence of the ubiquitous vulture, thus permitting approach of the predatory hawk to within striking distance.

Mueller (Condor 74:221, 1972) believed aerodynamic considerations, not mimicry, to be responsible for the Zone-tail's dihedral and manner of flight. He noted that raptors which habitually fly near the ground share this design, not only the Turkey Vulture and Zone-tailed Hawk, but also the harriers (*Circus* spp.). Unfortunately, we lack information on the relative frequency and importance of "high" vs. "low" hunting by *Buteo albonotatus*.

Willis (*op. cit.*; Condor 67:104-105) twice witnessed Colombian Zone-tails pursuing prey, but he found little information on the hunting of North American birds. The few references he cited leave much to be desired, one of them possibly not referring to *Buteo albonotatus* at all. Despite several attempts over the past six years I have not succeeded in following a Zone-tail from its breeding site to a feeding area. The following account is of a chance encounter with an individual actively seeking prey on 3 July 1969.

Driving northwest of Silver City, New Mexico, my attention was drawn to a flying vulture-like bird. As the time was 08:55 (Mountain Daylight Time), 30 to 40 minutes before Turkey Vultures take wing locally, I stopped and confirmed my suspicion that the bird was a Zone-tailed Hawk. It flew slowly, 15 to 20 m above ground, near some low hills flanking a dry valley several km long and less than 1 km across. Occasionally the bird descended to about 10 m, tilting irregularly as it progressed along the hillsides precisely as do vultures in their regular efforts to detect carrion in this valley.

For 40 minutes the hawk cruised back and forth parallel to the elevated ridges, occasionally returning to certain favored areas over which it flew re-

peatedly. It concentrated on the bases of the hills, but neglected neither their summits nor the yucca- and mesquite-studded valley floor. Once, over the latter, from a height of about 25 m, the hawk half-folded its wings and plunged almost vertically toward a spotted ground squirrel (*Spermophilus spilosomus*). It dropped almost to the ground but swooped upward as the rodent escaped under a mesquite. Following this attempt, the hawk slowly passed over the valley, hunting continuously. As it approached the juniper and oak scrub on the opposite side, it was attacked by a male American Kestrel (*Falco sparverius*) which swooped repeatedly, not striking but coming very close and protesting vocally. The Zone-tail promptly accelerated and left the vicinity, flying just above ground for a short distance, then ascending to its usual hunting altitude of about 25 m. The falcon returned to its perch after pursuing the hawk for a minute or so. On the preceding day I had seen two fledgling kestrels here with their parents. Their presence possibly triggered the falcon's aggressive reaction.

During the entire hunting episode the Zone-tail covered a linear distance of at least 1 km. At 09:40 several Turkey Vultures appeared along the hills. By then the hawk had climbed to an elevation of perhaps 200 m over the valley floor, still maintaining its vulturine appearance, gliding and occasionally flapping. At no time did it flatten its wings. Suddenly, it plummeted earthward toward something invisible to me. Missing again, it came out of its impressive dive barely above ground—this time pursued vigorously and vociferously by two Western Kingbirds (*Tyrannus verticalis*) which launched from some tall yuccas, one of which held their nest. After the flycatchers returned to their territory, the hawk remained in view for another ten minutes before disappearing over the ridge. It did not join the vultures which were taking advantage of rising warm air currents near the hills.

Birds and mammals witnessing other species' aggressive reactions toward a Zone-tailed Hawk probably would be alerted and ready for escape. Certainly the attention-attracting responses of the kingbirds and kestrel cited above should have aroused most potential avian and mammalian prey in the vicinity. Such reactions to Zone-tails could be construed as an argument against the efficacy of any alleged mimicry. On the other hand, these observations do not necessarily indicate recognition of the Zone-tailed Hawk as a predator. Kingbirds com-