

TABLE 1
WING MEASUREMENTS OF *C. CRURALIS* AND *A. FASCIATUS*

Species and authority	Wing length, mm	
	♂	♀
<i>Cinclorhampus cruralis</i>		
Lack (1968)	65-68	28-32
Ralls (pers. observ.)	112	83
Snow (pers. comm.)	107	83
<i>Accipiter fasciatus</i>		
Lack (1968)	269	477
Wattel (1973)	262	302
Brown and Amadon (1968)	264	302
Ralls (pers. observ.)	261	299

cated by Lack. Data for one specimen of each sex that I measured and specimens measured by Brown and Amadon (Eagles, Hawks, and Falcons of the World, vol. 2, Hamlyn Publ. Group Ltd., Feltham, England, 1968) are similar to those of Wattel (Table 1). It seems probable that the most extreme case of sexual dimorphism in size favoring females in birds is a member of the genus *Accipiter* but it is not clear whether or not it is *A. fasciatus*. Several other species have more extreme female/male ratios by wing length according to the figures in Wattel. The most extreme case in North America is *A. striatus*. This species has a female/male ratio of 1.19 by wing length and 1.21 by the cube root of weight (Snyder and Wiley, Ornithol. Monogr., in press).

Amadon was correct when he said in 1959 that more extreme cases of sexual dimorphism in size favoring males occurred in mammals than in birds: the elephant seal, *Mirounga leonina*, is a much more extreme case than either the Brown Song-lark or the Capercaillie (Bryden, Growth 33:531-536; Bryden in Harrison, ed., Growth and Development of Marine Mammals, vol. 1, Academic Press, New York, 1972). The most extreme cases favoring females in birds probably exceed those found in mammals.

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New bird records for El Salvador.—During June of 1964 I accompanied the late Merriam L. Miles on an ornithological trip to El Salvador. Considering the paucity of ornithological investigations in El Salvador, it was not surprising that during our 18-day trip we collected 3 previously unrecorded species. The specimens were

deposited in the Louisiana State University Museum of Zoology. The species are as follows:

Ruddy Duck (*Oxyura jamaicensis*).—Four of these ducks were observed on 18 June 1964, on Laguna de Chanmico, Dept. Libertad; a female was collected (LSUMZ 50481).

Least Tern (*Sterna albifrons*).—A pair of Least Terns was observed on 27 June 1964, at the small coastal fishing village of La Herradura, Dept. La Paz; a female was collected (LSUMZ 50503).

Melodious Blackbird (*Dives dives*).—This species was observed twice; a female (LSUMZ 50677) was collected on 13 June, 21 km W. of Libertad, Dept. Libertad, and a male (LSUMZ 50676) on 28 June 1964, at Laguna de Chanmico, Dept. Libertad.

I thank John P. O'Neill for providing information about these specimens.—ALAN FEDUCCIA, *Dept. of Zoology, Univ. of North Carolina, Chapel Hill, 27514. Accepted 13 Jan. 1975.*

The impact of an underground nuclear fracturing experiment on cliff-nesting raptors.—Almost any development and use of a natural resource has concomitant impacts on resident wildlife; stimulation of natural gas wells with nuclear fracturing techniques is no exception. On 17 May 1973, three 30-kiloton nuclear explosives were detonated 1900 m below the earth's surface in Rio Blanco County, Colorado in a U.S. Atomic Energy Commission-CER Geonuclear sponsored experiment called Project Rio Blanco. This note deals with the effects of ground motion resulting from that experiment on cliff-nesting hawks and eagles.

If nuclear stimulation of natural gas fields is to become a part of a national energy program, associated environmental costs must be carefully weighed. Two nuclear stimulation tests were conducted prior to Project Rio Blanco but environmental studies were not performed concurrently. The environment, including raptor populations, was studied before and after 2 underground nuclear tests on Amchitka Island, Alaska. Project Milrow damaged a cliff containing a Peregrine Falcon (*Falco peregrinus*) eyrie (White et al., *Bioscience* 21:623-627, 1971) and Project Cannikan destroyed or damaged 3 Peregrine Falcon and 6 Bald Eagle (*Haliaeetus leucocephalus*) nest sites (Kirkwood and Fuller, USAEC Report BMI-171-147, 1972). However, these tests differed from Project Rio Blanco in 3 important aspects. First, they were weapons tests and not nuclear fracturing experiments. They were 100 times more powerful and were closer to the surface; therefore, vertical displacement and damage were much greater. Finally, both tests were conducted in late fall, long after the raptor breeding season.

The nuclear devices of project Rio Blanco were detonated during the raptor nesting season. Red-tailed Hawk (*Buteo jamaicensis*) nests in the area contained eggs or newly hatched young; Golden Eagle (*Aquila chrysaetos*) young were 2-4 weeks old. In order to ascertain the impact of ground motion on active raptor nests, we searched for nests on cliffs within 16 km of the test site. On 15 May active nests found in an April 1973 survey conducted by Colorado Division of Wildlife were checked by helicopter. Additional cliffs were also visited and contents (eggs, young) of each active nest were noted. Portions of the study area not flown were searched from the ground on 16 May; nests located were examined and contents recorded. Nine Red-tailed Hawk and 3 Golden Eagle nests within the study area and 2 Red-tailed Hawk nests beyond the 16 km perimeter were documented prior to detonation (Table 1). All active nests were again examined by helicopter within 4 hours post-detonation; general condition