GENERAL NOTES

Why Ospreys hover.—Ospreys (*Pandion haliaetus*) fish from a perch or while in flight. Birds hunting from the air interrupt gliding or flapping progression with intermittent 2–10-sec hovering bouts in which they hold themselves stationary in the air column. They dive on fish directly from a gliding "interhover," but more often from a hover (pers. obs. in Florida, Maine, New Jersey, and New Brunswick, Canada). Here I examine the adaptiveness of hovering.

In March of 1974 and 1975, I found the fishing success of Ospreys working Lake George, Lake Co., Florida to be dependent on weather. When the sun was clouded over or the lake surface rippled by wind, the birds' capture rate and dive rate were both significantly depressed. I attribute these effects to reduced visibility into the water (Grubb, Auk 94:146–149, 1977).

To pursue the adaptiveness of hovering, I noted the success of each dive from a hover or interhover (Fig. 1). Although I have no information on energetic costs of gliding and hovering in Ospreys, I presume the latter to be generally more expensive. An exception occurs in strong winds when an Osprey can "glide" with zero ground speed. As it is more costly, for hovering to be adaptive it should result in a large increase in capture rate.

Details on methods are in Grubb (op. cit.). Briefly, I watched Ospreys seeking fish in a 0.2 km^2 rectangular area off Lake George's western shoreline. Numerous parameters of foraging behavior and concomitant weather were recorded.

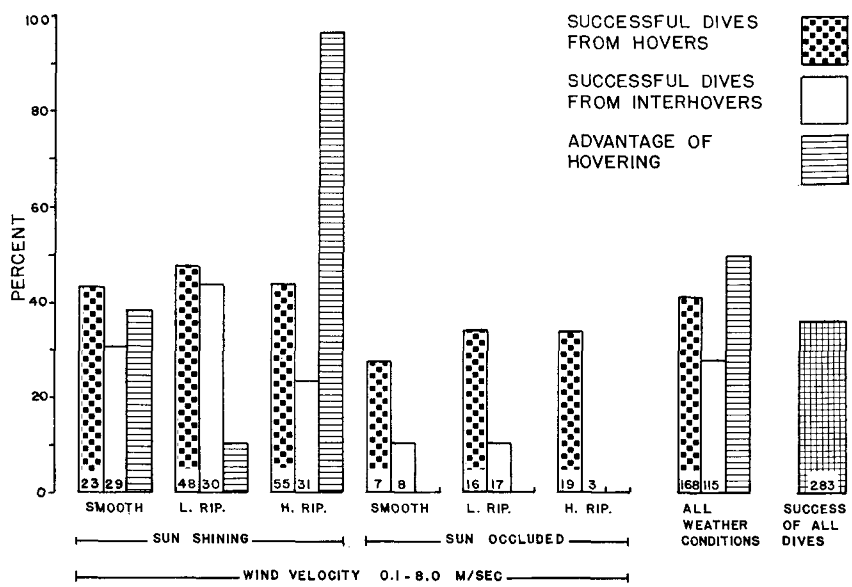

FIG. 1. Success rates of Ospreys diving on fish from a hover or from an interhover under various weather regimes, and advantage of hovering. Hovering advantage is not calculated for sample sizes less than 20. Smooth = calm water surface; L. Rip. = lightly rippled water surface; H. Rip. = heavily rippled water surface.

The success rate of dives from hovers and interhovers under various weather regimes is shown in Fig. 1. Under all weather conditions combined, dives from hovers were 50% more successful than dives from interhovers, a significant difference ($p < .05$; $\chi^2 = 5.90$, $df = 1$).

A complete picture of the adaptiveness of hovering should account for the energetic cost of hovering *vis-à-vis* gliding flight. Unfortunately, I lack the information necessary for such a comparison. The size distributions of fish appeared similar under all weather regimes, whether caught from a hover or a glide. Thus, Ospreys which never dove from a hover would have to save approximately 50% of the energy expended by those diving from hovers to compensate for the hoverers' increased energy intake.

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Storage of piñon nuts by the Acorn Woodpecker in New Mexico.—The food habits of the Acorn Woodpecker (*Melanerpes formicivorus*) have attracted considerable attention (MacRoberts, Condor 72:196–204, 1970, and references therein). The most distinctive aspect of this behavior is the species' extensive dependence on stored mast. The nuts, generally acorns, are harvested by groups of birds in the fall, and placed in holes that are especially excavated for this purpose in dead trees, dead limbs of live trees, power poles, fence posts, etc. The stored mast is then communally used and defended from competitors by the groups during the rest of the year. However, most of the information about this and other aspects of the food habits of the Acorn Woodpecker has been obtained from studies of California populations. Relatively little is known about its behavior elsewhere.

As part of a study of the behavior and ecology of this species in the American Southwest, we periodically observed groups of Acorn Woodpeckers from December 1974 to August 1975 in Water Canyon, New Mexico. This canyon, located in the Magdalena Mountains near Socorro, contains riparian vegetation. Gambel's oak (*Quercus gambelii*) and the gray oak (*Q. grisea*) are present, and piñon-juniper (*Pinus edulis* and *Juniperus* spp.) forests are found along the sides of the canyon.

When our observations began, 7 out of the 10 groups of Acorn Woodpeckers which were studied held relatively large stores. Much of this mast consisted of acorns. However, in addition to acorns, we found that many piñon nuts also had been collected. When we examined a section of the storage tree of one of the groups in January, 84 out of 128 holes counted were found to contain piñon nuts, while 17 held acorns and 21 were empty. A recently fallen limb from the storage tree of another group had the remains of piñon nuts in 11 out of 33 holes, while the others were empty. In addition, during the winter and spring, woodpeckers often foraged among the piñon pines along the sides of the canyon, and birds consumed piñon nuts both on the storage trees and at "anvils" located among the pines. While the storage of acorns by southwestern populations of Acorn Woodpeckers has been reported by a number of authors (cf. Bent, U.S. Natl. Mus. Bull. 174, 1939), we know of no published reference to the use of piñon nuts by this species.

These observations suggest that piñon nuts, when available, form an important part of the diet of Acorn Woodpeckers in Water Canyon. California populations of the species have been observed to store other types of nuts besides acorns, including almonds, pecans, and walnuts obtained from orchards. However, according to Ritter (The California Woodpecker and I, Univ. of Calif. Press, Berkeley, 1938), the use of these nuts generally occurs