pupae and adults of *Musca* and larve of *Tenebrio*. Pellets are generally spindle-shaped; 30 measured gave the following means: length 0.907 ± 0.024 cm, max. width 0.374 ± 0.012 cm, and weight 0.026 ± 0.002 g. The pellets are greenish-brown in color and composed of a dense matrix of small pieces of plant fibers and bits of chitin, in which are embedded sand grains and hard seeds which range in diameter up to 2.5 mm. The relative proportions of these components varies considerably. Exoskeletal parts of insects (*Tenebrio, Musca*) are reduced to such small fragments that identification is difficult. The pellets are held together by a mucous-like substance, which is water-soluble. Upon casting, they are sticky and soft but subsequently become hard. As ejection is accompanied by vigorous headshaking, pellets often adhere to nearby objects. Based on a group of 18 birds from which pellets were gathered collectively, the average interval between successive ejections for an individual bird was approximately 20 days.

Pellet formation in the Ovenbird provides a possible mechanism to eliminate gravel and sand from the ventriculus where it accumulates in large quantities (Bent 1953, U.S. Natl. Mus. Bull. No. 203: 465). As the birds in our laboratory were not provided regularly with sand, small, hard seeds in a food supplement were apparently retained as a substitute for grit. This also occurs in gallinaceous birds (Beer and Tidyman 1942, J. Wildl. Mgmt. 6: 70).

In spite of many hours of close observation of free-living Ovenbirds, we have never witnessed the ejection of a pellet. As this is an inconspicuous and apparently infrequent event, it is possible that it occurs in the wild but thus far has escaped notice.—RETO ZACH AND J. BRUCE FALLS, *Department of Zoology, University of Toronto, Toronto, Canada M5S 1A1.* Accepted 17 Jul. 75.

Weather-dependent foraging in Ospreys.—Interest is increasing in the constraints placed by the physical environment on avian foraging. Grubb (1975) found that significant shifts in the foraging "niches" of temperate woodland birds accompanied changes in winter weather. Dunn (1973) correlated fishing success in two terns (Sternidae) with variation in water surface condition and wind speed. Ueoka and Koplin (1973) report that tide cycles influence rate of fish capture in Ospreys (*Pandion haliaetus*), but their methods render this result difficult to interpret. I report here that sunlight and water surface condition significantly affect the fishing activity of Ospreys.

During late March of 1974 and 1975 I watched Ospreys fishing in Lake George near the outlet of Salt Springs Run, Lake County, Florida. I used binoculars and a stopwatch to monitor birds fishing within 200 m of a 1-km stretch of the western shoreline. Each bird entering this area was followed until it left, with or without a fish. The Ospreys hunted from the wing exclusively and, by definition, either from a hover (stationary in the air) or from an interhover (gliding or flapping flight). I assume the great majority were breeding as incubation was in progress at nearby nests, so all were at least yearlings. At the conclusion of each bird contact, I measured wind velocity 1 m from the lake surface with a portable anemometer, and noted whether the sun was shining (defined as presence of shadows). Also I recorded the lake surface as smooth, lightly rippled, or heavily rippled. Because of a treeline along the western shore, wind from the west disturbed the water surface in the study area much less than winds of the same velocity coming across the lake from the east. Thus the influences of water surface condition and wind velocity could be separated. I read temperature and relative humidity every half hour.

For analysis of interval data I employed the terminal 2-min sample from each observation bout. This procedure biased upward the determination of successful dives/min for all weather combinations. Other calculations capitalized on all available information. Significance levels were found with chi-square and extended median tests (Siegel 1956).

TABLE 1
EFFECT OF WIND VELOCITY ON OSPREY FORAGING[1]

	Wind velocity (m/sec)		
	0.1–4.0	4.1–8.0	P
Hovers/min	1.42 ± 0.18 (53)[2]	1.34 ± 0.16 (46)	0.74
Hover length (sec)	3.01 ± 0.23 (42)	3.89 ± 0.49 (37)	0.44
Dives/min	0.29 ± 0.05 (53)	0.25 ± 0.04 (46)	0.96
Successful dives/min	0.13 ± 0.03 (53)	0.09 ± 0.04 (46)	0.40

[1] Conditions: sun shining and lake surface lightly rippled.
[2] $\bar{x} \pm s_{\bar{x}}$ (N).

TABLE 2

EFFECT OF SUNLIGHT ON OSPREY FORAGING[1]

	Sun shining	Sun occluded	*P*
Hovers/min	1.38 ± 0.12 (99)[2]	0.72 ± 0.13 (60)	0.006
Hover length (sec)	3.89 ± 0.28 (79)	3.28 ± 0.30 (33)	0.84
Dives/min	0.28 ± 0.04 (99)	0.13 ± 0.03 (60)	0.001
Successful dives/min	0.11 ± 0.02 (99)	0.03 ± 0.01 (60)	0.008

[1] Conditions: wind velocity 0.1–8.0 m/sec and lake surface lightly rippled.
[2] $\bar{x} \pm s_{\bar{x}}$ (N).

The Ospreys executed unpredictable patterns of turns, glides, hovers, and dives while patrolling the strip of lake. Of 283 dives over all weather conditions 103 (36%) produced prey. Of the catches close enough to identify, all but one were either crappie (*Pomoxis* sp.) or mullet (*Mullus barbatus*). Successful birds routinely bore their catch inland across the adjacent western shore unless ambushed by a Bald Eagle (*Haliaeetus leucocephalus*).

Temperature and relative humidity remained within such narrow ranges, 24–31°C and 53–70% respectively, that I disregarded them when examining other weather variables.

Wind velocity effects were analyzed by holding sunlight and water surface categories constant. Higher winds decreased rates of attempted and successful capture, depressed rate of hovering, lowered the percentage of dives that produced a fish, and raised the proportion of mullet in the catch, but none of these differences was significant. Table 1 and Fig. 1a portray this nonsignificant impact of wind variation under a regime of direct sunlight and lightly rippled water surface. Similar results held across the other combinations of sunlight and lake surface, and so for analysis of the latter variables, I lumped records over all wind velocities from 0.1–8.0 m/sec.

When clouds occluded the sun, Osprey foraging changed significantly. Rate of fish capture was depressed by two-thirds and diving rate by a half. Rate of hovering was also halved, but the length of individual hovers did not differ significantly from sunlit conditions (Table 2). Under cloud cover the success ratio of dives and percentage of dives from hovers were also reduced, but not significantly (Fig. 1b). The results illustrated obtain for lightly rippled water; outcomes similar in every respect occurred when the lake was smooth or heavily rippled.

The condition of the lake surface also significantly influenced Osprey foraging. For records under sunlight only, increasingly disturbed water found capture rate and dive rate cut by one half. The rate of hovering was up significantly, but not the mean length of individual hovers (Table 3). With greater rippling, the proportion of dives from a hover and the percentage of mullet in the catch increased non-significantly. No apparent trend emerges from dive success ratios (Fig. 1c). Analysis for cloudy conditions revealed similar findings wherever sample sizes permitted.

Cloudy weather and rippled water acted independently to reduce the Ospreys' catch per unit time. Reduced visibility is the likely common denominator. That the birds simply spied fewer fish is supported by two lines of evidence. Decreased capture rates were not caused by significant drops in success of dives, but rather by significant decreases in dives initiated. I presume Ospreys only dive after spotting a target. Mullet are silver-sided, continually moving, and are found almost exclusively in schools (pers. obs.). Crappies are darker, rather sedentary, and were solitary (on breeding territory) during my study. I think it no sampling accident that the proportionate catch of the more conspicuous mullet increased (even if not statistically significantly) when the lake surface was heavily rippled.

TABLE 3

EFFECT OF WATER SURFACE CONDITION ON OSPREY FORAGING[1]

	Water surface condition			
	Smooth	Lightly rippled	Heavily rippled	*P*
Hovers/min	1.03 ± 0.02 (51)[2]	1.38 ± 0.12 (99)	1.63 ± 0.10 (146)	0.01
Hover length (sec)	2.59 ± 0.04 (38)	3.89 ± 0.28 (79)	3.55 ± 0.15 (133)	0.30
Dives/min	0.42 ± 0.06 (51)	0.28 ± 0.04 (99)	0.21 ± 0.03 (146)	0.006
Successful dives/min	0.19 ± 0.03 (51)	0.11 ± 0.02 (99)	0.08 ± 0.01 (146)	0.003

[1] Conditions: sun shining and wind velocity 0.1–8.0 m/sec.
[2] $\bar{x} \pm s_{\bar{x}}$ (N).

A complete picture of foraging energetics must include energy expended in hunting as well as in food intake (Emlen 1966). I found weather-dependent catch rates from 0.03 to 0.19 fish/min of hunting (1.80 to 11.40 fish/h). Although I have no information on metabolic costs of hunting in Ospreys, I believe that the size distributions of the Ospreys' prey were very similar under the various weather regimes. Thus Ospreys fishing over lightly rippled water under cloudy conditions (Table 2) must expend an average of six times as much energy per fish captured as Ospreys fishing over smooth water in sunshine (Table 3).

Through their influence on fishing success, cloud cover and rough water may have considerable impact on Osprey populations, particularly during the reproductive season. Assuming that animals are "geared" through selection to produce offspring at a maximum rate, I offer the following predictions. In localities with much year-to-year variation in weather (e.g. Bay of Fundy), breeding seasons marked by unusually cloudy and/or windy conditions (independent of temperature) will bring off a reduced crop of young Ospreys. Large

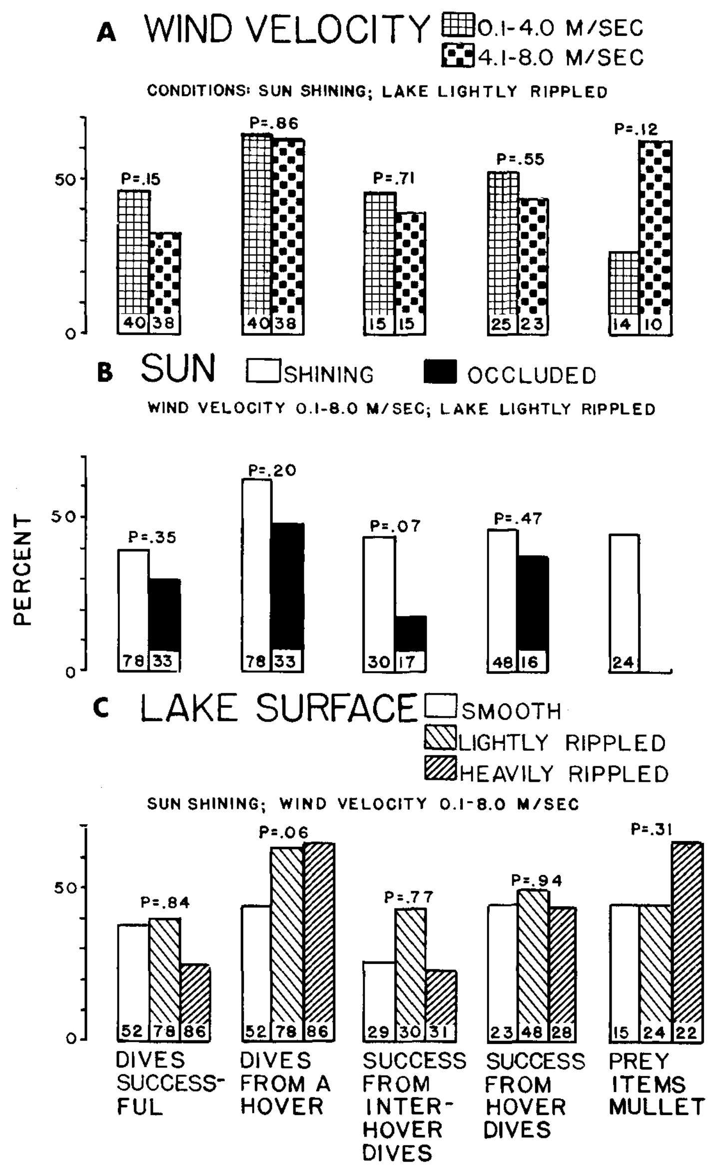

Fig. 1. Effects of wind velocity (A), sunlight (B), and water surface condition (C) on Osprey foraging. Sample sizes appear within the bars and levels of significance above the bars.

bodies of water in regions with prevailing winds will have greater nesting success and perhaps the highest nest densities along their leeward shores.

Comparisons of temporally and/or spatially separated Osprey foraging appear of little use without accompanying data on prevailing weather. For instance, because Lambert (1943) did not record weather conditions, I cannot suggest other reasons why the Ospreys he studied (89% of dives successful) were 147% more effective than those I watched.

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Impoundment of the Tombigbee River and bird distribution.—The impoundment of the Tombigbee River at Demopolis, Alabama forms a pool that backs up to Gainesville. This offers an opportunity to study the distribution of birds on impounded and unimpounded portions of a stream flowing through the Black Belt, a coastal plain formation.

I made 12 boat trips during the period 19 September to 16 November 1972, each trip approximately 10 miles, 7 of them up the unimpounded river, 5 down the impounded portion. During 5 of the 7 upstream trips I saw a total of 54 Spotted Sandpipers (*Actitis macularia*); on 6 of the upstream trips I recorded a total of 51 Killdeers (*Charadrius vociferus*). On the impounded portion of the river I saw no Killdeers or Spotted Sandpipers. The explanation of this disparity seems to be the association of these birds with sandbars. The sandbars of the unimpounded river are kept clear of vegetation while the sandbars of the impounded portion are overgrown, mainly by cockleburrs (*Xanthium stumarium*).

Further study is needed to determine if other species are affected in a similar manner. The Black Vulture (*Coragyps atratus*) is another bird closely associated with the unvegetated sandbars of the unimpounded river where their numbers were far greater than on the impounded river, but the large variation in numbers and small number of samples did not yield a significant difference between the two portions of the river ($P = 0.2$) although the number encountered was quite different (46 per trip vs. 6 per trip).

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A Caribbean Barn Swallow recovery.—An immature Barn Swallow (*Hirundo rustica erythrogaster*) that I banded (71-98120) 29 August 1964 at Vischer Ferry Wildlife Management Area (42°47′N, 73°48′W) near Schenectady, New York was recovered by P. H. Erkens 44 days later on 12 October aboard a freighter off the coast of Panama (direct recovery distance of about 2450 miles, 55.7 miles per elapsed day). The freighter left Cristobal, Canal Zone (9°20′N, 70°53′W) at or before dawn that morning bound northeastward for Europe. The last view of the Panamanian coast was at 1000 to 1100. During the morning, a flock of 12–24 Barn Swallows came in off the sea and began circling the ship, following it out to sea. Between 1400 and darkness at 1900, the birds settled on the ship and were so exhausted that they could be approached and picked up. By the following day all were dead.

When the freighter left port, the sky was overcast. It became sunny, and the air was very warm in the afternoon. The weather in the Gulf of Mexico and Caribbean Sea appears to have been influenced by at least two low-pressure systems. A low that was over Lake Huron at 1300 EST on 9 October had a trailing cold front extending south to Georgia and turning west paralleling the Gulf coast. By 1300 on 10 October the cold front had advanced out over the Gulf about one-half the length of the Florida peninsula; and a