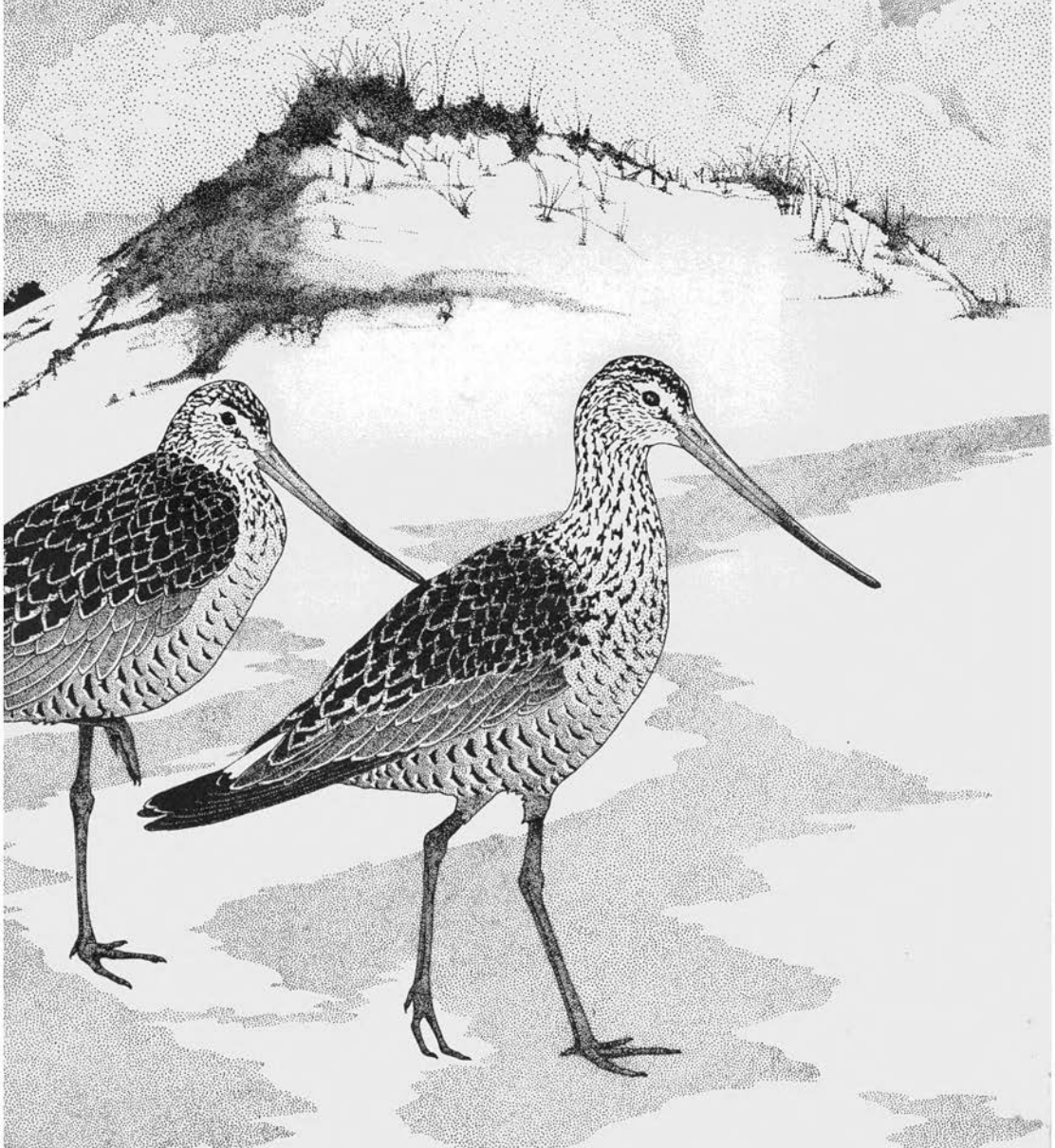


BIRD OBSERVER

OF EASTERN MASSACHUSETTS



JUNE, 1979

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EDITOR'S PAGE

TEN GALLONS TO THE PARASITIC JAEGER

Are you now calculating how many gallons of gas will be required to get you to a favorite bird or birding site and back? Last April BIRD OBSERVER offered to publish a car-pooling reference list for interested birders. At the time, gas was "only" 74¢-86¢ per gallon and in abundant supply, which might explain the very limited response to our offer. Gasoline is now 86¢-99¢ per gallon (and rising), if you can find an open gas station. Will you be out of gas when the Noddy Tern is discovered on Plum Island? Or will you be sitting in a gasoline line for three hours while the Mississippi Kite is perched in Wellfleet?

You can save gasoline, money, and perhaps see more birds if you car-pool on many of your birding trips. If you regularly bird one of the following areas (in season) and would be interested in car-pooling, please send us your name, address and telephone number on a postcard, noting which of the following areas you like to bird with some regularity: the Outer Cape, Monomoy, Westport-Dartmouth, Cape Ann, Newburyport-Plum Island, the Sudbury Valley, Mt. Wachusett, and Quabbin. We will publish this information in a forthcoming issue if the response warrants. Car-poolers will be clustered by general region of residence, so you can make your own arrangements with someone in your area.

Send your postcards to: Bird Observer, 462 Trapelo Road., Belmont, Massachusetts 02178.

SUMMER AND FALL PELAGIC TRIPS

The Brookline Bird Club is sponsoring the following pelagic birding trips this year.

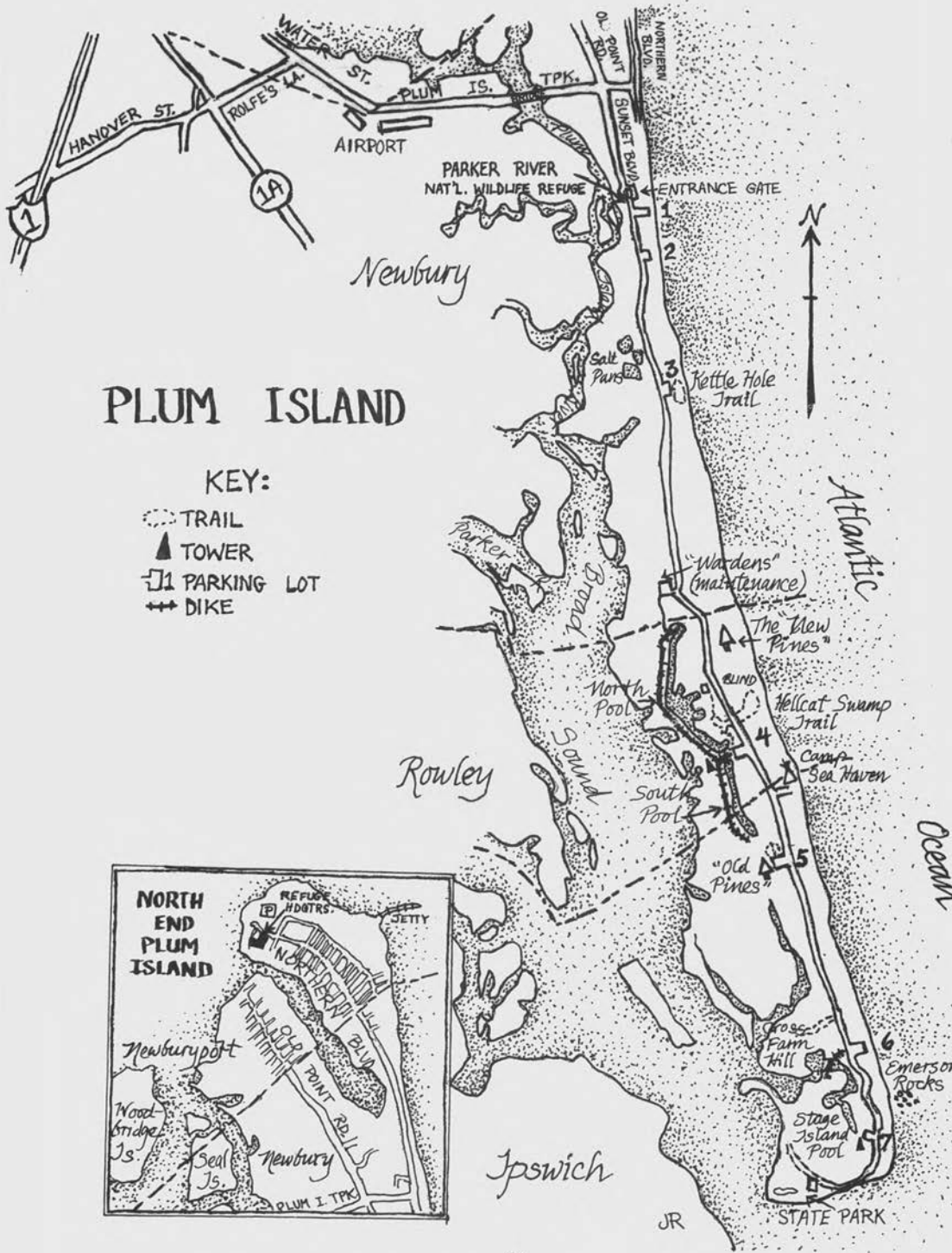
On August 26, a boat will depart from Lynn for the fishing grounds of Provincetown. For details, contact William Drummond, 375-0292 (Haverhill) or Herman Weissberg, 526-4020 (Manchester). Reservations can be made by sending a non-refundable prepayment of \$12.50 to Mr. Herman Weissberg, P.O. Box 23, Manchester, Massachusetts 01944.

On September 30, a boat will leave Harwichport for Pollock Rip. For a reservation, send a non-refundable deposit of \$8 (by check) to Mr. Herman D'Entremont, P.O. Box 207, Newton Center, Massachusetts 02159. (For further information, call Mr. D'Entremont at 734-1289.)

The final trip of the season will leave from Plymouth on October 28. Send a non-refundable deposit of \$8 to Mr. D'Entremont at the address given above.

LOON PUBLICATION: INFLATION STRIKES

"The Common Loon," the proceedings of the recent national conference on loons, is now available from the Loon Preservation Committee of the Audubon Society of New Hampshire for \$6.50 postpaid, an increase of \$1 over the original price. Payment must accompany the order which should be sent to: Loon Preservation Committee, Humiston Building, Main Street, Meredith, New Hampshire 03252.



THE FOUR SEASONS AT PLUM ISLAND

by Herman D'Entremont, Brookline

and Soheil Zende, Somerville

(PART II - SUMMER-FALL)

Located 35 miles north of Boston, at the confluence of the Merrimack, Parker, and Ipswich rivers, Plum Island is reached by driving southeastward on Water Street, Newburyport. Geologically, the island is a barrier beach backed by swampy hollows. A salt marsh dominates the western half of the island, and fresh water from the rivers combines with tidal flow to produce a brackish environment full of nutrients. Plants, crustaceans, insects, and rodents thrive and, in turn, attract the migrant and resident birds that make Plum Island so inviting to bird and nature lovers.

The southern two-thirds of the island is part of the Parker River National Wildlife Refuge, managed by the U. S. Department of the Interior. Information, maps, refuge regulations, and bird lists are available from:

1. Parker River N. W. R. Headquarters, Northern Boulevard, Plum Island, Newburyport, Massachusetts 01950 (telephone 617-465-5753). This location is at the north end of the island, at the Coast Guard lighthouse.
2. The booth at the refuge entrance, which is staffed most of the year during daylight hours.

Since the appearance of Part I of this article (Winter-Spring) in Vol. 6, no. 6, of BIRD OBSERVER (Nov.-Dec. 1978), the refuge management has initiated a series of alterations which will take several years to complete.

Several modifications have already been completed. The seasonal bathhouse at Parking Lot #1 has been converted to an all-year comfort station (the showers have been removed). Parking lots formerly numbered 2, 4, 7 and 9 have been closed. Parking lots previously numbered 3, 5, 6, 10 and 11 have been enlarged. (See map for the new parking lot numbers and locations.) The roadbed in the vicinity of Stage Island has been shifted westward to permit natural dune development.

Projects underway but not completed include the elevating, widening, and surfacing of the refuge road as far as the Rowley line. If additional funds are obtained, the project may be extended the length of the refuge. The refuge management is also reintroducing a number of animal species not recently found on the island, including Beaver, Red and Gray Squirrel, Bobwhite and Wood Duck.

In the near future, a new headquarters and visitor center will be built at the area known as the Warden's. This complex will house displays on the natural history of the island and include a blind overlooking the North Pool of Hellcat Swamp. The current refuge headquarters, at the northern tip of the island, will be closed.

The refuge is open to the public, without charge, every day on the following schedule: May 1 to October 15, 6 a.m. to 9 p.m.; October 16 to April 30, dawn to dusk.

SUMMER

Greenhead flies and mosquitos, nature's guardians, post their best troops at Plum Island during the summer months. The beach is beautiful, however, and on any summer weekend if you're not at the entrance by 9 a.m. you may find yourself turned away. After 300 cars have entered the refuge, it is closed to all traffic--including pedestrians--after 3 p.m.

Arriving early has its rewards. An early-morning high tide at the salt pans (mile 1.2) often provides the unmatched spectacle of a hundred or more Snowy Egrets stalking prey and squabbling among themselves. Interspersed among them are Great Blue, Little Blue, Louisiana, and Green Heron, together with Glossy Ibis.

The majority of the Little Blues seen at this time are white immatures, which presents a difficult identification problem for the birder who looks for "greenish" legs. Immature Snowy Egrets show lots of green on the backs of their legs; hence one must take full advantage of the aspect of the birds and the excellent morning light to study the birds carefully. Snowy Egrets are apt to show their bright yellow "slippers" when they stir the water in search of food, a gesture the Little Blue never employs. Snowies also appear to be slightly larger with a thinner, longer, black bill in contrast to the fatter, bluish-pink bill on the Little Blue.

High tide also brings resting, feeding, and preening shorebirds to these pools. Least and Semipalmated Sandpiper, Short-billed Dowitcher, and Hudsonian Godwit--starting their southward fall migration--begin to appear by the first week of July and build up to their highest numbers in early to mid-August. Though the godwits are pretty unexciting when they huddle up with their bills tucked under their wings, flocks of these birds should be perused carefully for an occasional Marbled or a rare Bar-tailed. The chances for picking up one of these rarities increase as summer slips away into fall.

Much more active and interesting are the dowitchers, which seem to feed continuously. At high tide their sewing-machine bills probe the salt pans, at low the flats of Newburyport Harbor. In late July a fair number of Stilt Sandpipers appear at the salt pans. Long-billed Dowitchers arrive in August and must be carefully differentiated from the Short-billeds. Throughout the summer it is possible to run into an occasional Willet.

Lingering too long at the salt pans may mean that no parking lots will have room for your car, except #4 (Hellcat Swamp), which is "reserved for nature study." It is worth walking the swamp trails to observe breeding Willow Flycatcher, Gray Catbird, Yellow Warbler, Common Yellowthroat, and Swamp Sparrow.

The observation towers here and at Stage Island Pool (Parking Lot #7) are fine places to catch the light ocean breezes that keep one cool and the bugs away. Rails with young are often seen from both towers, and the southern one is a good place to wait out the elusive Least Bittern. Late July and August are best for seeing the latter, for the adults are actively feeding their young.

The Plum Island State Park, located on the southern tip of the island, is

a good place to look for that southern wanderer, the Royal Tern, as well as Black Tern and Black Skimmer, during late July and August. Look for these species associating with members of the resident tern colony.

FALL

As summer wanes and fall begins, the shorebirds build up in variety and numbers. Warblers filter in almost imperceptibly during the last three weeks of August. Purple loosestrife finishes blooming; wild rose and beach-plum approach fruition. Suddenly, in late August the air is full of swallows--tens of thousands of Tree Swallows interspersed with Barn, Bank, and Rough-winged course over the marshes and bushes. Sometimes they sit on the outer beach, turning it dark with their fluttering masses; at other times they swirl over the ponds or perch on the fences and wires around the Warden's. Chattering incessantly, the swallows herald fall as the Snow Geese do spring.

September and October are hawk-watch months. Although few buteo species are ever seen at Plum Island (Red-tailed Hawk is relatively common, however), accipiters, falcons, Marsh Hawk, and Osprey migrate regularly over the outer dunes. Particularly after a cold front has passed, hours spent facing northward on the dunes at the Kettlehole or Hellcat Swamp can reward one with excellent closeup views of Sharp-shinned Hawk and American Kestrel as well as an occasional Merlin or Cooper's Hawk. Peregrine Falcon is also seen regularly during the early fall, and even a Gyrfalcon is not beyond hope in late fall or winter.

Salt Pans to the Warden's

September brings the largest variety of shorebirds to the salt pans. As always, high tide is best, and early morning light is even better. Black-bellied Plover in all stages of moult predominate; most adults have extremely mottled breasts and bellies. But very buff-brown immatures are also seen, tempting one to call out Golden Plover. However, a look at the long heavy bill or the white rump convinces us otherwise.

Dunlin begin arriving, mostly in their drab gray basic (nonbreeding) plumage. Their smaller cousin, the White-rumped Sandpiper, is regular in small numbers--look for a very gray peep with gray vermiculation on the breast extending as a series of spots down the flanks. The bill is long and thin, though not so long or downcurved as the Dunlin. Western Sandpiper should be logged by a regular visitor, who in September might catch the second "wave" of Stilt Sandpiper (mainly immature birds).

Among the larger sandpipers, Hudsonian Godwit is seen in small numbers until October. Though continuing to diminish drastically, Greater Yellowlegs last well into November. In September Long-billed and Short-billed Dowitcher intermingle, but the former predominates during October. Red Knot can be expected, though Ruff, Reeve, and Curlew Sandpiper are more often hoped for than seen.

If the shorebirds suddenly take flight and scatter, look skyward for a Peregrine Falcon. Though only a speck in the sky, it can cause havoc among the shorebirds. But don't be too quick, for sometimes the scourge that puts the shorebirds into flight is a Merlin, itself an exciting

species to see. Or it may turn out to be a Marsh Hawk, gliding on stiff wings to be mobbed by the shorebirds themselves or the ever-present Starlings.

During October's peak waterfowl migration the salt pans hold large numbers of Green-winged Teal. At the roadside during this time of year, Sharp-tailed Sparrows are literally underfoot. Also, keep a lookout for Eastern and Western Kingbird, Yellow-bellied Flycatcher, and Cedar Wax-wing perched on high vantage points along the next few miles of road.

Moving on to the Kettlehole (Parking Lot #3), we quietly follow the circular path in search of fall warblers. This migrant trap is as good in autumn as it is in spring; stay especially alert for Western Kingbird, Olive-sided Flycatcher, and Connecticut Warbler.

The Warden's is the next stop (mile 2.6). Look for Clay-colored and Lark Sparrow amid Chipping, Field, Savannah, Song, Swamp, White-crowned, and White-throated Sparrow. If you have a parking permit, why not walk to the New Pines (mile 2.9-3.4) while checking both sides of the road for warblers? After crossing the dike, check all the waterfowl in the open water to the right; Pied-billed Grebe, Black-crowned Night Heron, Common Gallinule, and American Coot should be seen here. South of the dike is the Town Marker Field, which is cultivated with grains to feed the resident Canada Goose population. This is a good place to seek American Golden Plover, Baird's Sandpiper, and Buff-breasted Sandpiper; you might also find Horned Lark, Water Pipit, and Lark Sparrow. From the Town Marker, enter the New Pines for Saw-whet Owl, which is found every fall.

Hellcat Swamp

As in the spring, the variety of habitats accessible from this parking lot makes it a most enjoyable stop. After you cross the road heading toward the beach, the entire hillside is covered with poison ivy, which together with the bayberries are important foodstuffs for many migrating birds. Take your time and enjoy the solitude and the fall colors. From the highest dune perhaps you will see lines of cormorants migrating over the ocean or loons, or ducks, or Gannets, or ...

After returning to the parking lot at Hellcat, there is one more place to visit--about 50 feet west of the men's restroom a small trail goes through the bushes to the left. Soon you are on the extensive mudflat that borders the South Pool, an area favored by Baird's and Buff-breasted Sandpiper. Though only a few individuals occur annually, on a good day you will have an excellent opportunity to compare their sizes, proportions, and habits with the numerous Semipalmated Sandpiper, Semipalmated Plover, and Killdeer. The Buff-breasted Sandpiper is particularly enchanting--soft pink underparts, narrow white eyering, and the flash of white on the underwings during its zigzag flight.

Stage Island

While heading southward, stop at mile 6 and inspect all the geese atop Cross Hill Farm--you might find a White-fronted. (Three have been reported over the last three decades; the most recent record is September, 1978.) The next stop is Parking Lot #6. Search the grasses for Savannah

and Lincoln's Sparrow and also Water Pipit.

The evening heron flight is one of the major highlights of late summer and early fall. If you are willing to stay until dusk, you will witness long lines of all species arriving to roost for the night. In early morning these birds disperse to feed all over the extensive salt marsh to the north and west.

Plum Island State Park

The park provides easy access to the beach, and the surrounding dunes accent the advancing season by assuming their stark winter dress under a waning sun. Sanderling and Dunlin might be working the water's edge and the flats, while Common and Forster's Tern may be seen, often accompanied by an avaricious jaeger in pursuit of a meal. But now we concentrate our attention on the waterbirds that will spend harsh months offshore: the sea ducks and, hopefully, a few alcids. Who knows what might show up?

As we return northward, look for what was missed on the way down the island. If high tide is approaching, carefully check the marshes for herons and rails. Snow Buntings might now be feeding in the field north of the Old Pines, or a peregrine might be buzzing Dunlin in the Salt Pans. Enjoy the beauty of the island. Many regulars believe that "Plum" looks best in late October and early November. As you leave the island in the chilly twilight of a late fall evening, you can contemplate the birds of the day and look forward to another year at the best all-round birding spot in Massachusetts.

ACCOMMODATIONS NEAR NEWBURYPORT

The severity of the fuel crisis might encourage many birders to spend an entire weekend in the Plum Island-Newburyport area. One of the better inexpensive motels in this region, the Susse Chalet is located on Rte. 110 west of Rt. I-95 in Amesbury. To reach it from Newburyport, take Rte. 1 north to Salisbury center, then turn west on Rte. 110 and continue until you pass under I-95; the motel will be on your left. Many other motels, some of them open all year, can be found along Rte. 1A east of its intersection with Routes 1 and 110 in Salisbury.

There are many fine restaurants in the area. The Sportsmen's Lodge on the Plum Island Turnpike is one of the most convenient and has good food at very reasonable prices. Good sandwiches and soups can be purchased at the Roast Beef Corral at the intersection of Rte. 1 and State Street in Newburyport. The Riverview, an inexpensive seafood restaurant, is located on Rte. 1 in Salisbury, a half mile north of the Merrimack River. The Hungry Traveller, located on Rte. 1A east of Salisbury center, is also quite popular.

Even though they may be in the Newburyport-Plum Island area for only a few hours, many regulars believe that no birding day in the region can be complete without a visit to Esbensen's Danish Bakery at 127 Water Street, Newburyport, near the seawall. If you are heading out to the island early in the morning, a cup of coffee or tea with your Danish can help get the day off to a good start.

GROUND-NESTING AND RELATED BEHAVIOR OF NIGHTHAWKS

(CHORDEILES MINOR) IN MASSACHUSETTS

by Alexander Hiam and Martin Sutherland

In the summer of 1978 three breeding pairs of Common Nighthawks (Chordeiles minor) were observed in the Myles Standish State Forest in Plymouth County, Massachusetts. Nests of two of the pairs were found, and all three pairs were followed until young were fledged or nesting was abandoned. These observations are of interest because the nesting of the Common Nighthawk has received little attention in recent literature, and because these are the first ground nests to be reported in Massachusetts since 1903. After this date, all reported nests have been on flat rooftops.

The Common Nighthawk is the most widespread of the six Caprimulgids (Nightjars and Goatsuckers) found in North America, and one of two species in its genus found on the continent. The other, the Lesser Nighthawk (C. acutipennis), is found in the southern and southwestern United States, and south to Chile and Brazil. The Common Nighthawk's breeding range covers most of North America from eastern Alaska to Hudson Bay and the Gulf of St. Lawrence in the north, and southward through Mexico and Central America as far as Panama (Ridgely, 1976). Common Nighthawks migrate in the autumn and can be found as far south as Cordoba and Buenos Aires in Argentina during the winter (DeSchaunensee, 1970). The form concerning us is the nominate race, C. m. minor, which breeds west to the eastern edge of the Great Plains and north to British Columbia and the southern Yukon (Bent, 1940).

While most Common Nighthawks nest on rooftops, it is only since the 1800's with the construction of buildings with flat, gravelled roofs that they have adopted this nesting habitat. Bent (1940) discusses the nesting of the Common Nighthawk in its traditional habitat; his conclusions can be summarized as follows: the site is chosen by the female and nests are generally solitary, though sometimes a few will be found close together. There is usually a large, well-defended nesting territory. Eggs are laid on the ground in areas where forest fires have recently occurred, but have also been found on gravel beaches, open rocky areas, and cultivated ground. Nests on fence posts and rails have been reported, and one pair of birds in Farrington, Maine, in 1908 occupied a deserted nest of the American Robin (Turdus migratorius).

The clutch almost always consists of two eggs, typically with dark speckles on a variable dull olive-gray ground color. Harrison (1975) reports that eggs are laid on successive days, and that they average 29.97 x 21.84 mm. Incubation takes 19 days, beginning with the laying of the second egg. Forbush (1927) suggests that the male may help incubate, but Bent (1940) and Harrison (1975) say that incubation is only by the female. We never saw a male on the nest. The young are usually fed by both parents, and after 25 days they can fly fairly well. Being somewhat precocial, the young may move around in the territory when still quite small. Our observations indicate that if the first clutch fails, another attempt may be made at breeding.

The males have a distinctive territorial flight, flying slowly over their

territories while uttering a loud, far-carrying "peent." They also make a loud "boom" by diving and pulling up sharply with wings thrust forward and down, causing the stiff outer primaries to vibrate. Males boom over their territory to defend it and to attract females.

Before this century, the Common Nighthawk was a common ground-nester in Massachusetts "in the pine barrens of the coastal plain ... and more locally in sterile fields and pastures" (Griscom and Snyder, 1955). By 1900, nighthawks were nesting on Boston rooftops, and they soon adopted this habit in other parts of Massachusetts (Bagg and Eliot, 1937). According to Griscom and Snyder, the ground-nesting population in this state "was decimated by the cold rains of 1903" after which there are no Massachusetts records of ground-nesting.

Indirect evidence suggests that small numbers of nighthawks may have continued to nest on the ground after this date, however. Bagg and Eliot (1937) report a few sightings of nighthawks in the summer of 1921 at Chesterfield and a booming bird in West Chesterfield on June 25, 1933, which suggests ground-nesting, but no nests were found. Nighthawks also bred on the Cape before 1903 and may have continued to breed at Sagamore as there were summer sightings in this area until 1942 (Hill, 1965). Kathleen Anderson of the Manomet Bird Observatory recalls summer sightings of Common Nighthawks around a burned-over area in Plymouth in the 1930's, and Trevor Lloyd-Evans of M.B.O. confirmed the presence of nighthawks in Myles Standish State Forest during the breeding season in recent years. Hence it is likely that the birds we observed are part of a small population which has continued to nest largely unnoticed in the pine barrens around Plymouth since 1903, rather than a recently established population.

THE NEST SITES. The three pairs of Common Nighthawks we observed were nesting in areas where forest fires had occurred approximately seven years previously, as determined by the number of tiers of branches on Pitch Pines in the areas. Two of the pairs held adjacent territories, and the third nested within two kilometers of the other two. Following is a description of the territories and nest sites of these three pairs, and a summary of our observations concerning nidification and behavior. The nest site descriptions are supplemented by a systematic list of plants, loosely ranked by density, at each site (see Table I). All botanical names are from Gleason, 1968.

PAIR I. The territory of this pair was the most open of the three. On one side stood a dense, mature (20+ yrs.) Pitch Pine (Pinus rigida) grove. On the territory, trees were widely spaced (up to nine meters apart) and few were much more than three meters in height. There were more dead Pitch Pines, both standing and on the ground, in this territory than in the others. The nest of Pair I was not found. However, according to Bent (1940), the male Common Nighthawk often booms over the nest. This was true of the males of Pairs II and III, and so we determined a likely nest site for Pair I where the male boomed most frequently. This site was used for the vegetation survey (Table I).

Pair I was the first to be discovered, when we heard a male peenting in the area on June 22. We made five more visits to the area without finding eggs or young, probably because the young were old enough to move about the territory. On the 12th of July we flushed a female and one

young bird just after sundown. The fledgling was smaller and rounder-winged than the adult, showing little white in the wings and none in the tail. It flew fairly well. On July 28 we saw one, and possibly two, young birds in the company of a female over this territory. Only this pair successfully fledged young.

PAIR II. The territory of Pair II was adjacent to that of Pair I, and the nest sites were approximately 2/5 of a km. apart. The mid-story in the territory of Pair II was thicker than in the territory of Pair I, but there were many small patches of open ground. A thick growth of fifteen-year-old Pitch Pines bordered much of the territory, and within it were small, dense groups of Pitch Pines. The nest site was a hard, bare patch of earth in a small clearing surrounded by Early Sweet Blueberry (*Vaccinium vacillans*) and a Scrub Oak (*Quercus ilicifolia*). The site was near four Pitch Pines but the eggs were not in shade for much of the day. There was no suggestion of nest building, the eggs being laid on bare ground.

Two eggs were discovered on June 29 when we flushed a female from them. On August 19 the female was still incubating the same two eggs (we are confident of this because we made numerous visits to the site up to this date). As they should have hatched by then, even if the second one had been laid on the day we found them, the eggs were collected. They did not appear infertile, but it seemed that their development had been arrested at an early stage. One measured 29.5 x 21.0 mm., the other, 31.1 x 23.3 mm. The birds were inactive after August 19. It is possible that this was a second clutch in view of the late date upon which the eggs were found, but the female may have been incubating this clutch for a long time prior to our discovering it.

PAIR III. Most of this territory was thickly grown over with Early Sweet Blueberry and Scrub Oak, but there were a number of large bare areas around the nest sites. This pair's first clutch failed, and a second clutch was laid about 18 meters away. Two small patches of bare ground, almost completely surrounded by Scrub Oaks of about two meters in height, formed the nesting sites.

Two young were found at the first nest site on June 25. Half an eggshell lay within 10 cm. of them, and they appeared to be about two days old. The young were crouching on a patch of bare earth under a Scrub Oak, but were not shaded from the sun. On July 5th these young had disappeared, and the female was flushed from a fresh single egg at the second site. It is possible that the young died in the heavy rains on the third and fourth of July, but it is more likely their death was due to some other factor, such as predation, considering that the female was on another egg just one day after the rains. On July 11 we flushed the female from two eggs, indicating that she had laid a full second clutch. By the 28th she was brooding a two- or three-day-old chick while an egg lay unattended 40 cm. away. The egg had begun to star, but appeared lifeless. On August 2, after a prolonged rain had caused minor flooding, we could find nothing but large fragments of eggshell at the site, and it is likely that the young died in this storm.

BEHAVIOR. In our numerous visits to the three territories, we were able to observe a range of behavior associated with territoriality and

response to predators (or, more exactly, ornithologists). As, to our knowledge, some of this behavior has not been described, we include the following descriptions.

Booming. As previously discussed, booming is used to defend the territory against conspecifics. Both females and males are boomed by a male on its territory, usually by flying above the intruder, then diving at it. In boundary disputes, two males may try to fly above each other, peenting and booming until they reach a considerable height. When the male is not disturbed by other nighthawks or predators, its dives and booms are generally directed at the nest site. Booming is also directed at human intruders, trucks, blinds, and presumably predators, in a manner similar to the dive-bombing of terns and other colonial-nesting birds. Booming in this context may serve to alert the female and young to the presence and position of a predator, as well as to frighten the predator.

Peenting. Peenting, like booming, is restricted to males, and functions in territorial advertisement. Males peent constantly in the air (never on the ground), sometimes in association with booming. Peenting also seems to function in contacts between mates, as males sometimes increase their rate of peenting when their mate returns from foraging. In this situation peenting may be associated with other behaviors. This is illustrated by an interaction observed on July 12 between the male and female of Pair I.

The female returned at 1800 hrs. after an absence of one hour, and was greeted by the male with increased peenting while she uttered a croaking "craink" note. Gliding on stiff wings held in a shallow V and rocking from side to side, the male flew across in front of her while the female dived twice as if in (poor) imitation of the male's booms. She then went to the ground. Some of this behavior may have been related to our searching of the area and the presence of a young nighthawk, which we flushed (along with the female) upon going to the spot where the female had landed.

Rocking Flight. We observed this only once, as described above, but felt it worthy of mention because it was clearly stylized and very different from normal flight. Perhaps it is a part of courtship behavior, which occasionally also serves in communication between mates.

Circling. Often when we searched an area where a male had been booming (in our attempts to locate the eggs or young), the male would boom us for a short while, and then begin to circle quietly, flying within ten meters of the ground and sometimes passing within five meters of one of us. Once, circling was observed after we had left the territory. It appeared that the male had lost sight of us and was trying to locate us by flying over its territory. The male of Pair III, who frequently circled, sometimes made a soft churring sound while circling.

Circling functions exclusively as a predator response, unlike booming which functions primarily in territoriality and display. The purpose of circling may be to locate the predator and keep it in sight.

Distraction. Distraction display by the female when she is flushed from

eggs or young has been well described by Tomkins (1942), and in the Lesser Nighthawk by Pickwell and Smith (1939). The female flies low to the ground and lands with wings and tail spread, and mouth fully open toward the intruder. This may be accompanied by hissing. We observed this display once when we flushed the female of Pair III from eggs on July 11. The hissing associated with this distraction and the "craink" in response to a male's peenting (see above) were the only vocalizations we heard from females.

DISCUSSION. Our observations show that a small population of ground-nesting Common Nighthawks exists in Massachusetts. Table I reveals that the nest sites of these birds are strikingly similar, both in the dominant species of plants present, and in the stage of succession of the areas. All three sites were in areas which had been burned over seven years earlier. It is possible that nighthawks would find satisfactory for nesting areas which had been burned more recently than this, as they have been reported nesting on more-open ground in other states (see Tomkins, 1942; Pickwell and Smith, 1938; Howell, 1959). However, it is unlikely that an area which had regenerated after burning for much more than seven or eight years would be satisfactory for nesting. The increasing human population in areas such as Plymouth, and the control of forest fires associated with this, has substantially decreased the amount of recently burned land available for nesting. This habitat destruction is clearly related to the decrease in ground-nesting nighthawks in this state and throughout the country.

It is possible that because of habitat destruction nighthawks were forced to adopt new nesting habitats, and that this resulted in the practice of roof-nesting. But it is also possible that with the building of flat gravelled roofs, a new nesting habitat was opened up in which nesting pairs tended to be more successful, so that many nighthawks deserted their traditional nesting areas. While the fact that habitat destruction did occur suggests that they may have been forced out of the traditional habitat, there is also some evidence to suggest that the new habitat was an attractive one. Predation, and loss of clutches due to flooding, must be less frequent on rooftops than on the ground. In addition, feeding habits seem to differ in cities. Nighthawks take advantage of lights which attract insects, and this may allow them to feed later into the night. For example, Shields and Bildstein (1978) found that Common Nighthawks in the vicinity of "six large spots lighting a sign" which "created a superabundant consistently renewing food source" generally fed near this sign despite competition from other crepuscular insectivores, i.e., bats, which competed aggressively with the birds, confining them to certain elevations when both were present.

It may be that roof nests also differ from ground nests in the range of temperatures to which they are exposed. Bent (1940) suggested that rooftop temperatures could exceed ground temperatures on sunny days, and Weller (1958) reports that on a gravelled roof in Missouri where Common Nighthawks nested, temperatures reached 60 degrees C. and higher. Ground nests are exposed to fairly high temperatures also, and nighthawks have evolved certain physiological and behavioral mechanisms (i.e., gaping, shading young) to cope with these high temperatures (Lasiewski and Dawson, 1964; Howell, 1959). Nonetheless, if roof temperatures are more extreme, the species may have further modified physical and behavioral adaptations in order to cope with this.

TABLE I - PLANT CENSUS

PRESENCE AND DENSITY* OF SPECIES AT NEST SITES OF:

	PAIR I	PAIR II	PAIR III
<u>Canopy</u> 2.5m.+			
Pitch Pine (<u>Pinus rigida</u>)	High	Medium	High
White Pine (<u>P. strobus</u>)	Low	Low	Low
Big Tooth Aspen (<u>Populus grandidentata</u>)	Low	-	-
Black Locust (<u>Robinia pseudo-acacia</u>)	-	Low	-
<u>Mid-Story</u> 1-2.5m.			
Pitch Pine (<u>P. rigida</u>)	Low	Medium	Low
Scrub Oak (<u>Quercus ilicifolia</u>)	Low	Medium	High
<u>Ground Cover</u> 0-1m.			
Early Sweet Blueberry (<u>Vaccinium vacillans</u>)	Medium	Medium	High
Low Sweet Blueberry (<u>V. angustifolium</u>)	Low	Low	Low
Bearberry (<u>Arctostaphylos uva-ursi</u>)	High	High	High
Sweet Fern (<u>Comptonia peregrina</u>)	Medium	Medium	Low
Golden Heather (<u>Hudsonia ericooides</u>)	Medium	Low	Medium
Black Huckleberry (<u>Gaylussacia baccata</u>)	-	Low	Low
Wild Indigo (<u>Baptisia tinctoria</u>)	Low	-	Low
Stiff Aster (<u>Aster linariifolius</u>)	Low	Low	-
New York Aster (<u>A. novae-belgii</u>)	-	Low	-
Bristly Sarsaparilla (<u>Aralia hispida</u>)	-	Low	-
Sedge sp. (<u>Carex</u> sp.)	Low	Low	Low
Goldenrod sp. (<u>Solidago</u> sp.)	-	Low	-
Wormwood sp. (<u>Artemesia</u> sp.)	-	Low	-

* Relative densities are ranked (Low, Medium, High) to be consistent within categories (Canopy, Mid-Story, Ground Cover) as their sole purpose is to provide a basis for comparison of nest sites.

- Indicates that a species is absent from a site.

Other aspects of behavior, for example, those associated with feeding, may also be different in roof-nesting populations. The discovery of a ground-nesting population makes it possible to compare such traits, to see how they differ between ground- and roof-nesting birds, and perhaps to understand better the nighthawks' shift of breeding habitat. A thorough understanding of nighthawk behavior is clearly important in such a comparative study, and it is hoped that our observations of nighthawk behavior will be useful in this context.

We hope to continue this study of the nesting of the Common Nighthawk in the coming summer. Any information concerning other ground-nesting birds in the state, or roof-nesting birds to which observers might gain access, would be much appreciated. Information may be sent to Alex Hiam, c/o Manomet Bird Observatory, Manomet, Massachusetts 02345.

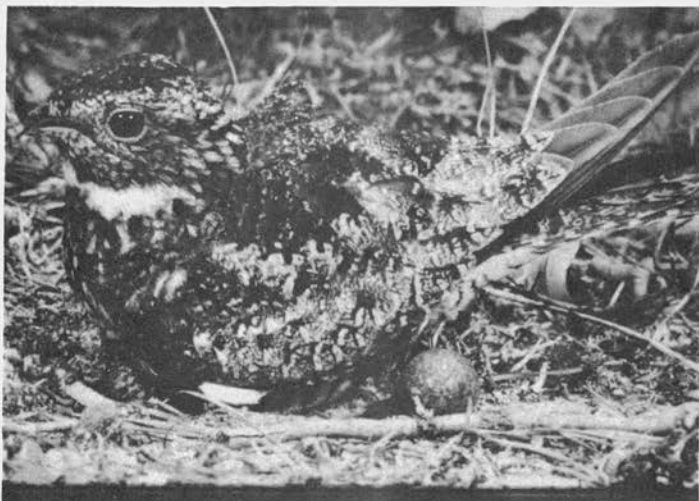
ACKNOWLEDGMENTS

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Female Common Nighthawk at Nest
 Myles Standish State Forest, Plymouth
 Photo by Jack O'Connor, Courtesy of Manomet Bird Observatory

GOLDEN EAGLES IN EASTERN UNITED STATES

Sightings and reports of Golden Eagles east of the Mississippi River are being systematically catalogued by the U.S. Fish and Wildlife Service to determine the bird's status in the eastern U.S. Any such sightings should be reported to:

Dr. Mark R. Fuller
 Migratory Bird and Habitat
 Research Laboratory
 Patuxent Wildlife Research Center
 U.S. Fish and Wildlife Service
 Laurel, Maryland 20811

THE MOURNING DOVE IN MASSACHUSETTS

by Michael J. Brazauskas,

The Massachusetts Division of Fisheries and Wildlife

Whether dotting the telephone lines along a country road or perched on an urban birdfeeder, the Mourning Dove or "Turtle Dove" can be seen throughout most of the state. The Mourning Dove, a distant cousin of the Passenger Pigeon, is a streamlined bird whose total length ranges between 11 and 13 inches. The eastern subspecies (Zenaida macroura carolinensis), which nests in Massachusetts, is slightly larger and more colorful than its western relatives.

Both the male and female dove have red legs, short dark bills and a long, dark, tapered tail with large white spots on the edge. The general body color is light brown, and the male possesses a bluish-gray crown and neck along with a light pink breast. This color distinction between the sexes can be used in the field. Immature birds can be distinguished by buffy-colored tips on the wing coverts.

The familiar call, a soulful oosh, cooo, cooo, coo has given the bird its name. It can most often be heard early in the morning when the males are establishing territories and courting mates. The distinct whistling sound created by rapid wing beats often calls attention to an otherwise unseen bird.

The Mourning Dove is seemingly one species which has adapted to man's alteration of the natural environment. City cemeteries, parks, shelterbelts, orchards, and ornamental trees and shrubs around homes are places one can find nesting birds. In Massachusetts nests are commonly built in conifers--spruces, cedars, and pines are utilized most often. These trees, spruce especially, offer horizontal branches with stiff needles that form a sound support for a nest as well as overhanging branches to provide protective covering.

The nest is a roughly constructed conglomeration of small twigs. Sometimes nests are placed on the ground, but normally they are located at heights between four and 30 feet, 14 or 15 feet being the average. In Massachusetts the nesting season begins in late March and peaks between late May and June. It has been found that 99 percent of all nests will have been initiated by July 30th.

The clutch of two, rarely three, pearly-white eggs is deposited on successive days, and incubation begins as soon as the first egg is laid. Researchers have found that usually the first egg is more oval in shape and shorter than the second, which is longer and more pointed. After approximately 14 days of incubation the eggs hatch. The young doves, called squab, are altricial; that is, at the time of hatching their eyes are closed, they are incapable of locomotion, and they are totally dependent on the parents for food.

The helpless young are sustained on a diet of "pigeon's milk," a liquid that is secreted from the crop linings of both the males and females. Pigeon milk is rich in calcium and vitamins A, B, and B₁. After a few

days of straight pigeon milk, the diet is supplemented with partially digested seeds and insects. The nestlings' weight increases some 30-fold within two weeks of hatching.

Since the young are fledged in about 12 to 14 days, a complete nesting cycle requires approximately 30 days. In some areas of the country as many as six broods may be fledged in one year by a single nesting pair of Mourning Doves. In Massachusetts, however, age-ratio data for doves banded from June 1st through September 30th indicate nesting pairs successfully fledge 3.1 young, roughly equivalent to two broods per nesting season. More clutches are initiated but many, particularly the early ones, are lost due to windy spring storms.

The Mourning Dove is primarily a seed eater; hence, it can often be observed along field edges. Some insects are taken as well, but these contribute only about one or two percent of the total diet. Small seeds from weed plants and grasses such as ragweed, foxtail, panicum grass, and crab grass are reliable food sources. Millet, sunflower, and agricultural crops such as corn, wheat, rye, oats, and rice are also important.

Although primarily thought of as a migratory species, doves found overwintering in Massachusetts have become more common during the past decade or so. Christmas Bird Counts over the past 20 years show that the number of doves sighted has increased 30 times. Banding data indicates that some 40 percent of adult and 22 percent of immature doves winter over despite the harsh conditions. Birds trapped for banding are sometimes found with toes lost to frostbite, a positive sign of overwintering. Since the Mourning Dove is a frequent visitor to backyard feeders, the increased popularity of bird feeding has probably led to increased survival. Unlike the Turkey and Ring-necked Pheasant, the feet of doves are delicate and are not well adapted to scratching through ice and snow for seeds.

Doves that do migrate usually leave by the end of October and sometimes congregate in staging areas. A sudden drop in temperature is the impetus to migration. Once on the wing, these birds are capable of flying 100 miles a day, usually settling for the winter in the mid-Atlantic and southern states. Band recoveries have been noted from Maryland, North Carolina, South Carolina, Virginia, and Georgia. Because it is a migratory bird, Mourning Dove management falls under the responsibility of the federal Fish and Wildlife Service. One of its projects, conducted in conjunction with state conservation agencies such as the Massachusetts Division of Fisheries and Wildlife, is to monitor population levels through data collected from banding and call-count surveys.

Call-count surveys may be unfamiliar to some readers. They consist of an observer recording the number of doves heard calling during a three-minute interval at 20 different stations along a 20-mile route. These data are analyzed statistically to yield population indexes which, combined with banding data, are part of the basis from which hunting regulations are developed.

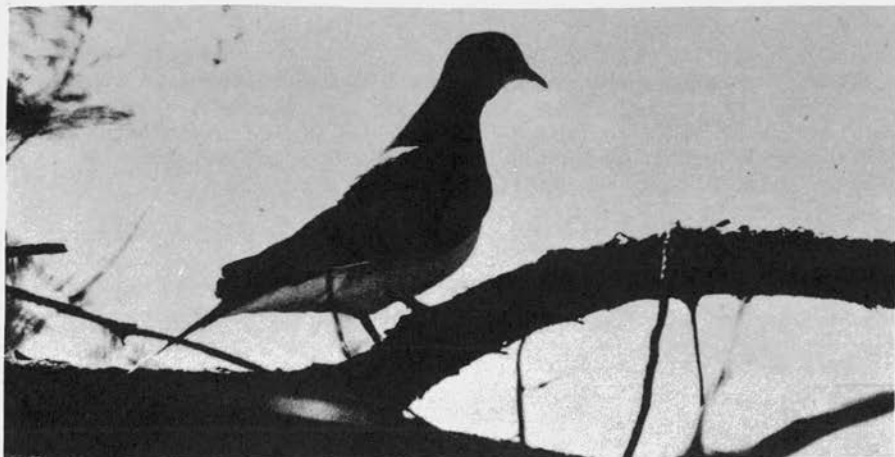
The Mourning Dove is our most important migratory game bird. It is presently hunted in 33 of the 48 contiguous states with some 49,000,000

being harvested yearly. Despite this seemingly heavy hunting pressure, hunting mortality makes up a very low portion of the total mortality. In South Dakota, where a dove season was first initiated in 1967, hunting mortality accounted for 16 percent of the population. Furthermore, the total annual mortality increased only three to four percent over that of pre-hunting years. Thus, hunter harvest adds only slightly to the total population mortality. Doves that would have died from other causes were instead harvested by the hunter.

Here in Massachusetts the dove has been afforded protection since 1903. However, states to the south do hunt doves that migrate from Massachusetts to winter in their harvest areas. The effects of such hunting are slight. Band recovery data for Massachusetts-banded doves (corrected for band reporting rates and crippling loss) indicate that hunting accounts for less than 3 percent of our doves' total mortality. Far greater numbers die from natural causes. Intrastate band recoveries for Massachusetts-banded doves indicate capture by domestic cats or collision with motor vehicles and stationary objects account for most of the mortality. Evidence of these types of mortality are very visible to man and are more likely to be reported than "unseen causes" of death.

The latter, which accounts for a good percentage of overall mortality, include predation by raptorial birds such as the Cooper's Hawk, sudden adverse weather, and disease. Prevalent dove diseases are "fowl pox" (*Borrelia avium*) and trichomoniasis, commonly called "dove disease" or "canker disease." Large outbreaks of dove disease have affected millions of birds in the past. In 1950, for example, a trichomoniasis epizootic was so severe that several states had to cancel their hunting seasons.

Nationally, Mourning Dove mortality due to hunting is low--far more doves die from natural causes than from the hunter's gun. When properly regulated hunting doesn't harm dove populations, rather it insures substantial numbers of doves for the future, for the enjoyment of all.



Mourning Dove photographed by Bill Byrne
Courtesy of Massachusetts Division of Fisheries and Wildlife

RESULTS OF THE 1978 CHRISTMAS BIRD COUNTS

IN EASTERN MASSACHUSETTS

by Robert H. Stymeist, Brookline

A total of 172 species were recorded on 18 counts held during December 16-January 1 inclusive in eastern Massachusetts. This was augmented by three additional races: Blue Goose, Ipswich Sparrow, and Oregon Junco. A Harris' Sparrow at Westport, Massachusetts, brings the total to 176 species with additional races. Highlights include Sooty Shearwater, Whistling Swan, Blue-winged Teal, Red-shouldered Hawk, Peregrine Falcon, Sora Rail, Long-billed Dowitcher, a jaeger (species), a skua (species), Lesser Black-backed Gull, Common Murre, Common Puffin, Western Kingbird, Bohemian Waxwing, Solitary Vireo, and Harris' Sparrow.

For those unfamiliar with Christmas Bird Counts, they are a census of wintering bird species taken within a defined area--a circle 15 miles in diameter. This was the 79th annual run. In 1977-78, a total of 609 species, plus 23 infraspecific forms were accepted; this represents 120,912,723 individual birds!

The following tables represent the results of 18 eastern Massachusetts counts. They have not been edited for questionable species, of which there are some; we will leave that up to the National Audubon Society's editor.

Trends of wintering bird populations can be determined by the yearly CBC data. This year the absence of Blue Jays was most apparent. At Concord, normally the location of the nation's high concentration of Blue Jays, reported a mere 281 as compared with 1874 the year before. Other normally common species such as Brown Creeper, Golden-crowned Kinglet, Tree Sparrow, Dark-eyed Junco and White-throated Sparrow were also way down. On the other side of the coin, Northern Shrikes totaled 43 this year, and other increases were noted with raptor species. There was no winter finch invasion compared with 1977, though all were reported.

The complete results of the 1978-79 Christmas Bird Counts can be obtained for \$4.50 from the National Audubon Society, 950 Third Avenue, New York, New York 10022.

<u>Species</u>	<u>Athol</u>	<u>Buz. Bay</u>	<u>C. Ann</u>	<u>C. Cod</u>	<u>Concord</u>	<u>G. Bos.</u>	<u>M. V.</u>
Common Loon	1	42	39	30		3	67
Red-throated Loon			2	11		1	1
Red-necked Grebe		6	1	2			1
Horned Grebe	5	583	21	8		6	22
Pied-billed Grebe		33		33	1	1	6
SOOTY SHEARWATER				1			
Gannet			39	8000			1
Great Cormorant		157	231	365		123	27
Double-crested Cormorant		1		6			
Great Blue Heron		34	6	38		4	21
Green Heron							
Black-crowned Night Heron		8		4			2
American Bittern		1		2			
Mute Swan		40	2				118
WHISTLING SWAN							
Canada Goose		1022	511	803	985	117	620
Brant		47		1517		2	
Snow Goose							
"Blue Goose"							
Mallard	6	308	473	353	594	1779	185
Black Duck	42	1092	2939	3214	173	2004	460
Gadwall		3	13			2	13
Pintail		2	2	3		1	
Green-winged Teal				7	3	1	4
Blue-winged Teal							1
American Wigeon		94		8		53	29
Northern Shoveler			1				
Wood Duck		2				3	3
Redhead		30		8			1
Ring-necked Duck		88		82	2	1	
Canvasback		194		31		6	59
Greater Scaup		5584		10		4696	1
Lesser Scaup		574		18		35	
Common Goldeneye	2	1839	503	397	1	649	405
Barrow's Goldeneye		1	1			1	
Bufflehead		2490	313	1335		482	295
Oldsquaw		998	24	105		7	19
Harlequin Duck				11			
Common Eider		1312	864	6242		5029	4439
King Eider				1		1	
White-winged Scoter		682	245	180		67	1918
Surf Scoter		309	2	27			2
Black Scoter		127	63	360			170
Ruddy Duck		1		37			
Hooded Merganser	5	229	2	9	4	30	11
Common Merganser	19	67		58		26	102
Red-breasted Merganser	6	1774	312	274		623	1831
Goshawk				1	2		
Sharp-shinned Hawk		5	2	12	2	1	
Cooper's Hawk					3		1
Red-tailed Hawk	4	2	5	9	38	30	24
RED-SHOULDERED HAWK							
Rough-legged Hawk					3	3	3
Bald Eagle	2			1			

Sp.	Marsh.	Millis	Nant.	N. B.	Newbpt.	Plym.	Quin.	Taun.	Tuck.	Wilm.	Worc.
CL	9		355	5	27	31	2		14		2
R-tL	4		375		2	4			4		
R-nG	6		94		1	10			5		
HG	6		101	20	36	13	55		4		7
P-bG		2	34	1		14		1	1		1
SS											
G			83		2	1					
GC	5		55	32	5	22	350	1	11		
D-cC			1	1	1						
GBH	20	1	55	6	2	4	5				
GH									1		1
B-cNH			10				5		12		
AB											
MS			81	49	2	45			17		
WS					1						
CG	907	378	817	1483	1925	378	85	124	70	2	388
B	2405		31	4	160	315	1182		44		
SG					4						
"BG"			3								
M	133	627	283	180	64	518	447	138		220	450
BD	1822	230	510	315	3495	1522	1558	260	101	25	106
G		4	16		19	13	4				
P			3		43	7	2		2		
G-wT			82	5		2	3				1
B-wT							1				
AW			272	4	5	20	23		48		
NS			1	1	1						2
WD		1	3				2				1
R			29	2					90		
R-nD		2	40			23	2				
C			240		1	1	8	408	12		
GS	21		1924	1820	8	8	1792	3			
LS			452	15			1				
CG	211		3117	295	729	219	320	76	330	6	15
BG	1		4		3		1	1			
B	176	1	1067	439	508	222	1394	12	50		
O	39		24267	30	46	25	9		3215		
HD			1								
CE	9027		18585		15	5867	3432		4678		
KE			1				1				
W-wS	352		1547	224	32	146	258		126		
SS			147	21		16			2		
BS	81		85	7		6	1		127		
RD		1	4								
HM		1	3	6		16	13	87			1
CM	12	20	8	2	46	264	21	15	10	7	39
R-bM	205		2711	80	91	729	1381		330		
G		1			1						2
S-sH	2	4	9		3	4					3
CH											
R-tH	6	20	31	6	19	11	11	9	2	8	16
R-sH		1									
R-lH	4	1	13		3	3	1	2	2		
BE			2								

Species	Athol	Buz. Bay	C. Ann	C. Cod	Concord	G. Bos.	M. V.
Marsh Hawk		3		23		1	13
PEREGRINE FALCON				1			
Merlin		1		4		1	
American Kestrel		10	10	26	13	18	11
Ruffed Grouse	2	5	1		29		
Bobwhite		158		29			20
Ring-necked Pheasant	3	5	15		104	128	11
Virginia Rail		1		5	2		
SORA					1		
Common Gallinule							1
American Coot		22	4	74		35	18
Killdeer		1					3
Black-bellied Plover				47		4	4
Ruddy Turnstone			3				
American Woodcock				1			1
Common Snipe		10	3	6		2	3
Greater Yellowlegs		1		1			
Lesser Yellowlegs							
Purple Sandpiper			170			1	4
Dunlin			50	2215		197	5
LONG-BILLED DOWITCHER							
Sanderling		42		750		100	45
Red Phalarope							
JAEGER, sp.						1	
SKUA, sp.				1			
Glaucous Gull							
Iceland Gull			10	1	1	3	
Great Black-backed Gull		263	11840	6073	86	914	140
LESSER BLACK-BACKED GULL							
Herring Gull	29	3307	20546	15430	670	10001	1630
Ring-billed Gull	2	311	105	591	12	1112	30
Black-headed Gull		1		1		3	
Laughing Gull				2			1
Bonaparte's Gull		440	656	101		36	151
Little Gull							
Black-legged Kittiwake			3	9000			
Razorbill				6			
COMMON MURRE							
Black Guillemot		1	3				
COMMON PUFFIN				2			
Rock Dove	207	460	223	50	1129	3415	53
Mourning Dove	88	478	235	206	929	153	93
Barn Owl							3
Screech Owl		3	1		24	11	6
Great Horned Owl		1		1	7	3	
Snowy Owl							
Barred Owl	1						
Long-eared Owl						1	
Short-eared Owl					1	3	5
Saw-whet Owl							
Belted Kingfisher	1	36	8	23	3	6	9
Common Flicker		35	3	45	3	7	25
Pileated Woodpecker	2				3		
Red-headed Woodpecker					2		

<u>Sp.</u>	<u>Marsh.</u>	<u>Millis</u>	<u>Nant.</u>	<u>N. B.</u>	<u>Newbpt.</u>	<u>Plym.</u>	<u>Quin.</u>	<u>Taun.</u>	<u>Tuok.</u>	<u>Wilm.</u>	<u>Worc.</u>
MH			40	3	1	2			9		
PF					1						
M			3			1					
AK	15	17	16	16	15	14	13	21	1	5	7
RG	1	11		1	9	29	6	5		1	9
B		23	16	4		28	2	53			
R-nP	1	17	63	8	15	1	7	2		13	17
VR	3		7			3					
S											
CG			1								
AC			88	28		62	12	32			
K	1		1	1	1	5		2			
B-bP	9		15			1					
RT			1				11				
AW						1					
CS	2		3		14	4	1	12	1	4	
GY							1				
LY				2							
PS			60			1					
D	237		40	49	16	84	144				
L-bD					2						
S	25		479	4		85	21		1		
RP			6								
J, sp.											
S, sp.											
GG					2						
IG			30		3		1				
GB-bG	335	153	1884	71	415	640	920	81	232	89	18
LB-bG			2								
HG	8355	2139	8770	2078	6265	7364	16296	1682	488	4513	1184
R-bG	27	6	25	182	67	434	779	5	8	5	17
B-hG			2				2				
LG											
BG			1406	231	169	54	192		1620		
LG					3						
B-LK	1		451				30		9		
R			12								
CM			1								
BG			4		2						
CP											
RD	334	468	114	496	435	222	411	218		1069	441
MD	115	135	339	492	231	221	71	407		691	331
BO			1								
SO	2	6			24	5	2	1			1
GHO	1	3			4	3	4	2		1	1
SO					8						
BO					1			1			
L-eO			1					2			
S-eO	4		5				2		6		
S-wO		1	1								
BK	5	4	4	5	1	7	6	1			5
CF	18	1	88	9	3	8	3	4	16	12	1
PW		2									
R-hW											

<u>Species</u>	<u>Athol</u>	<u>Buz. Bay</u>	<u>C. Ann</u>	<u>C. Cod</u>	<u>Concord</u>	<u>G. Bos.</u>	<u>M. V.</u>
Hairy Woodpecker	19	3	2	3	100	9	5
Downy Woodpecker	31	48	29	19	260	88	17
WESTERN KINGBIRD		1					
Horned Lark		54	56	83	28	15	25
Blue Jay	236	254	76	109	281	284	117
Common Crow	27	446	539	312	1357	1017	196
Fish Crow					2		
Black-capped Chickadee	484	806	269	509	2070	549	174
Tufted Titmouse	33	104	52	11	378	119	1
White-breasted Nuthatch	40	32	35	18	288	74	27
Red-breasted Nuthatch	22	6	1	1	8	3	2
Brown Creeper	3	6	3	4	13	13	8
Winter Wren		1		1		1	1
Carolina Wren		12		1			7
Long-billed Marsh Wren				4			
Mockingbird	3	129	40	72	171	76	20
Gray Catbird		8		2			1
Brown Thrasher							
American Robin	1	230	9	438	18	115	36
Hermit Thrush		8		1			
Eastern Bluebird				10			
Golden-crowned Kinglet	4	43		12	8	2	2
RUBY-CROWNED KINGLET		1	1				
BOHEMIAN WAXWING					2		
Cedar Waxwing		14		56	175	35	
Northern Shrike	2	2	2	2	10	5	2
Starling	687	22251	2099	1047	6787	103000	2006
SOLITARY VIREO		1					
Orange-crowned Warbler		2					
Yellow-rumped Warbler		551	39	397		2	162
Pine Warbler		1		1			
Palm Warbler		8		7			
Common Yellowthroat		1		1	1		
Yellow-breasted Chat		3		2			
House Sparrow	267	811	417	307	1535	749	78
Eastern Meadowlark		3		21		1	3
Red-winged Blackbird		2			3	14	
Northern Oriole		2	2	3		1	
Rusty Blackbird					9		
Common Grackle		4	2	1	11	9	1
Brown-headed Cowbird	3	17			3	28	
Cardinal	22	224	39	121	193	105	42
Evening Grosbeak	828	100	79	113	600	165	55
Purple Finch	12	13	5		85	3	2
House Finch	12	561	142	221	33	228	46
Pine Grosbeak	17			30			
Common Redpoll						8	
Pine Siskin			18	25		110	2
American Goldfinch	92	116	84	169	766	152	40
Red Crossbill						3	
White-winged Crossbill							1
Rufous-sided Towhee		16	6	3		2	5
Savannah Sparrow		5	2	13		6	
"Ipswich Sparrow"						1	

<u>Sp.</u>	<u>Marsh.</u>	<u>Millis</u>	<u>Nant.</u>	<u>N. B.</u>	<u>Newbpt.</u>	<u>Plym.</u>	<u>Quin.</u>	<u>Taun.</u>	<u>Tuck.</u>	<u>Wilm.</u>	<u>Worc.</u>
HW	4	19	2	7	23		2	12		96	10
DW	19	56	5	10	47	21	35	52	1	193	33
WK											
HL	21		55	71	62	10	27	2			7
BJ	43	96	76	82	242	249	44	108	12	682	94
CC	33	1011	418	158	427	187	206	411	20	438	236
FC		52									
B-cC	226	715	230	153	473	682	241	433	28	1245	474
TT	33	128		54	39	39	66	165		490	46
W-bN	9	66	2	23	63	24	26	61		207	52
R-bN	2	2	35		3	14	2	3	1	17	8
BC	1	10		2	21		2	2		10	3
WW		1			1	3	1				
CW				8				1			
L-bMW			5		2						
M	48	46	22	18	36	33	43	32	1	55	21
GC		1	6			1				3	
BT						2	1		1		
AR	7	2	306	44	57	80	6	26	2	3	1
HT	1		2			1	3				
EB											
G-cK	1	8	36	6	6	59		6			4
R-cK						5	1	1			
EW											
CW		48	32	37	53	95	4	48			12
NS	3	2			5	4	1		1	2	
S	1198	2595	9996	3885	6674	649	110000	8800	26	1930	8902
SV											
O-cW											
Y-rW	37		2983	72	21	481	26	81	72		
PW											
PW	1		60		1	1					
CY	1		2		1				1		
Y-bC			1								
HS	581	375	228	621	348	111	238	365		1359	292
EM	36		18	6	2			47	24		
R-wB			41	5	2			3		8	
NO											
RB	1										
CG		7	1		3			1		127	
B-hC		5	1	30			27	1		26	
C	32	53	38	55	18	41	29	66		141	18
EG	24	215	97	19	245	241	2	557	2	191	306
PF		22		29	8	5	8	41		74	2
HF	8	21	69	87	5	78	90	38		45	54
PG		1		1					1		
CR										1	
PS		8						12		65	
AG	245	217	68	67	162	156	43	438	1	697	54
RC							12				
W-wC											
R-sT	1		6	7		3	1	2			
SS	5		20		1	4	1	14	12		
"IS"			3			3					

<u>Species</u>	<u>Athol</u>	<u>Buz. Bay</u>	<u>C. Ann</u>	<u>C. Cod</u>	<u>Concord</u>	<u>G. Bos.</u>	<u>M. V.</u>
Sharp-tailed Sparrow				2			
Dark-eyed Junco	49	148	45	17	374	232	31
"Oregon Junco"							
Tree Sparrow	49	44	78	11	608	121	14
Chipping Sparrow		13					
Field Sparrow	1	70		32	16	10	2
White-crowned Sparrow		1			1	1	
White-throated Sparrow	5	275	25	121	66	67	32
Fox Sparrow		2		1		2	
Swamp Sparrow		28		17	17	3	2
Song Sparrow	1	346	21	143	127	105	46
Lapland Longspur			3	250		38	
Snow Bunting		13	44	281		4	27
Total # of species	46	113	79	119	67	101+1	96



Letter To The Editor

I was fascinated to read at least one observer's account of his time with the Salisbury Boreal Owl. Leif Robinson is probably correct in his belief that the amount of human interference the Boreal Owl experienced was not particularly detrimental to the bird and is quite likely not the reason for the owl's disappearance. What troubles me about Robinson's account of the "kitchy-kitchy-koo" episode is what it says about the attitude birders bring to their pursuit. One wonders if birds are playthings designed to amuse and satisfy bird-watchers? Or might birds be biological entities that we as bird-watchers can observe, study, admire and respect?

It is unfortunate that it was a member of the Massachusetts Audubon staff that touched the Boreal Owl. One would hope such staff members would be the model of good birding etiquette. But if an Audubon society staff-person can play with Boreal Owls, why isn't it fine for any birder to do whatever he or she wishes with any bird they chance upon? Clearly such a situation would present a very sad state of affairs. Obviously Massachusetts Audubon does not condone or support the interference of any part of a bird's natural history. All the research, sanctuaries and natural history education testify to that. But as birders let us take the time to re-examine our reasons for looking at birds. Observe them, scrutinize them carefully, delight in them, worship them. The reasons for being afield will be your own. But please, whatever your reasons, leave them alone. If nothing else, respect them.

Peter Vickery
Lincoln, Maine

(All letters to the editor are subject to condensation.)

<u>Sp.</u>	<u>Marsh.</u>	<u>Millis</u>	<u>Nant.</u>	<u>N. B.</u>	<u>Newbpt.</u>	<u>Plym.</u>	<u>Quin.</u>	<u>Taun.</u>	<u>Tuck.</u>	<u>Wilm.</u>	<u>Worc.</u>
S-ts											
D-eJ	67	182	72	95	121	248	141	340		594	97
"OJ"			1								
TS	69	218	9	21	214	36	90	116	2	226	87
CS				2							
FS	12	2	1	26		18	1	23			
W-cS				12			1			3	
W-tS	39	16	131	54	23	73	30	39	3	55	12
FS		1		2			2	1		30	
SS	44	13	23		11	24	8	2	1	2	3
SS	50	39	183	8	46	75	58	19	36	31	12
LL					1						
SB	2	4	23		59	73		1	60	5	
Tot.	79	68	118+2	80	96	94+1	94	71	60	50	54

"Birders"

The Outer Cape has long been famous for its impressive bird life. Both species diversity and bird populations are large and varied. From mid-July to November 1st the bird migration is spectacular! Henry David Thoreau, William Brewster, Arthur Cleveland Bent, Henry Beston, and Ludlow Griscom are among the great ornithologists and naturalists to study here.

The **Red River Motel** located on Route 28 in South Harwich on the Chatham Line has been purchased and is managed by a group of birdin' fools. We are close to the famed Monomoy Island Wilderness Area, Chatham - which is tremendous for fall land birds, Nauset Beach - shorebird Heaven and the surrounding waters of Cape Cod which abound with hard to get pelagic species. We also keep abreast of any rarities or unusual birds in the area and have an excellent local knowledge of what is going on.

Our room rates are competitive and for people staying with us there are some guided walks.

For further information stop by at the

RED RIVER MOTEL

Route 28

South Harwich, Mass. 02661

432-1474

1978 CENSUS OF HERON AND IBIS NESTS AT CLARK'S ISLAND,
PLYMOUTH, MASSACHUSETTS

by William E. Davis, Jr., Foxboro, Lincoln Smith, Cohasset,
and Brian A. Harrington, Manomet

The Clark's Island Heronry in Plymouth has been studied since 1975 by personnel of the Manomet Bird Observatory, and was last censused in 1975 (1). This summer we monitored the nesting success of herons and ibises in selected areas and censused the remainder of the island on June 6th. The counts of active nests for 1975 and 1978 are presented below. The figures for both years include nesting data from the study areas plus the census data for the remainder of the island and represent our best estimate for total numbers of active nests on the census date.

	Active nests	1976	1978
Black-crowned Night Heron		350	200
Snowy Egret		150	231
Glossy Ibis		40	20
Little Blue Heron		5	1+*
Great Egret		5	10
Cattle Egret		0	1?*
Unclassified		<u>0</u>	<u>16</u>
Total		550	478 *see text

A comparison of the nest figures indicated an overall stability of the total breeding population, but the relative abundance of the Snowy Egrets and Black-crowned Night Herons are notably different. The numbers for Little Blue Herons and Cattle Egrets are not accurate owing to imprecise identification of eggs and young of these species which are similar to those of Snowy Egrets. Moreover, adults were rarely observed on nests since the nesting areas were in dense foliage, and because we intentionally made sufficient noise on our approach to encourage early and careful withdrawal of the adults rather than the chick-and-egg scattering panics which can accompany surprise. Only one Little Blue Heron nest was identified. No more than one adult Cattle Egret was observed at one time in 1978. However, the fact that one bird lingered near a nesting tree, even while we worked in the area, suggests that there may have been at least one active Cattle Egret nest. At least three Cattle Egret nests were identified in 1977.

Nesting success for the 201 nests studied have not been analyzed, but a cursory examination suggests that the success rates are not substantially different from those reported for Snowy Egrets and Black-crowned Night Herons in 1975 when between two and three young per nest were raised to an age of at least 10 days.

There has been a gradual shift in the areas of highest nest density towards the north end of the island, and, as well, a shift of the tree species chosen for nesting sites. Although the Black-crowned Night Herons still preferred to nest in eastern red cedars, the Snowy Egrets, which had preferred deciduous bush nests in 1975 (1), now overwhelmingly selected cedars for nest sites. Over 200 of the Snowy Egret nests were

in cedars. In addition, there was a marked shift in the nest site preference among Glossy Ibises. In 1975 they nested only in deciduous bushes (1) while this year all but one nested in cedars. The Great Egrets followed a similar pattern, with the 1975 preference for high bush blueberry (1) altered to an exclusive preference this year for the exposed tops of pitch and white pines. These changes in nest site selection may reflect a general shift in the heronry from a shrubby area to an area characterized by fewer shrubs and more cedars, pines and cherries.

The factors which limit the size of this heron colony remain obscure and represent an important area for future investigation.

References

- (1) Harrington, Brian, 1975. "1975 Census of Waders at Clark's Island," Bird Observer of Eastern Massachusetts, Vol. 3, no. 5, Sept.-Oct., p. 167.

TAKE A SECOND LOOK, AGAIN!

How can you save \$10-\$25 in one day? By participating in the Take A Second Look program.

Take A Second Look is something more than the typical field trip. It is virtually a field seminar on an interesting subject of bird study. A number of local institutions offer excellent courses to aid our understanding of birds, but most of these cost \$10-\$25 for a single day. Take A Second Look is free!

Each TASL field trip is led by someone familiar with a particular habitat or other facet of bird life. The first trip distributed birders around the perimeter of Boston Harbor, where we observed winter waterfowl movements. This was instructive for many participants, most of whom had never before observed such activity on a coordinated basis. We also enjoyed the discovery of a Harlequin Duck, and a flock of Red-necked Grebes, several of which were observed courting close to shore. Observers then gathered at Soheil Zendehe's to pool counts and discuss what had been observed, benefitting greatly from the accumulated experience of Soheil, Craig Jackson, and Dave Brown.

Our next two TASL trips will study wading and shorebirds of local salt marshes. Soheil Zendehe will introduce you to the birds of Belle Isle Marsh in East Boston on August 5, and Dave Brown will lead a study of shorebirds in Squantum on August 26. Both sites can be reached by MBTA, and are a relatively short drive from the Rte. 128 perimeter. As participation is limited, anyone who is interested in one of the field trips should contact the leader in advance. Leaders will provide exact details as to meeting time and locations, and can preview what they expect to observe. Car pooling can be arranged.

August 5	"Wading and Shorebirds in a Local Salt Marsh"	Belle Isle Marsh	Soheil Zendehe (628-8990)
August 26	"Fulfillment of Resting and Feeding Requirements of Shorebirds with respect to tides in South Boston"	Squantum	Dave Brown (328-3553)

CHANGING HABITATS FOR NESTING BIRDS

by Neil Clark, Chestnut Hill

During the past few centuries, certain species of birds have radically changed their nesting habitat requirements. Many species (such as the Wood Duck) have become partially dependent on human-made structures, and some (such as the Purple Martin) have adapted so well that they are now totally dependent on civilization for their temporary homes.

Of the birds mentioned here, only two species, the Osprey and the Eastern Bluebird, have declined in great numbers in recent years, the Osprey because of a residue of hard pesticides still present in its watery environment, and the bluebird possibly because of competition from other species for its nesting sites. Numerous nesting sites are available for both species, but the areas surrounding the sites (like waterfronts for the former and orchards for the latter) are rapidly disappearing. It is sometimes not enough simply to provide a pole or box for a species and expect that it will benefit.

Four main types of human-made nesting sites are: the birdhouse, roofs and gutters, barns, and chimneys. Many species use the birdhouse, or nesting box: the Tree Swallow, the Eastern Bluebird, and especially the Purple Martin. The locally common martin now rarely nests in vast colonies in riddled old trees; instead it utilizes martin houses put up by concerned people. These houses contain 10-100 compartments (all measuring 6"x6"x6"), many of these apartments being occupied simultaneously. The large houses stand on poles usually fifteen feet up or higher. The martins seem to prefer being close to one another, as well as to water. Once they set up house, they will return April after April, paying off the rent by helping to rid the area of flying insects.

Some birds, such as Wood Ducks, American Kestrels, Great-crested Flycatchers, and House Wrens, use nesting boxes only part of the time. The Wood Duck will nest high in a natural cavity of a hollow tree, but also can nest in boxes placed in wooded swamps and at lake borders. Locally, Wood Ducks have been quite successful nesting in these large boxes at Great Meadows National Wildlife Refuge in Concord, and in surrounding towns.

The American Kestrel will take to a box in a suitable spot such as a farm, orchard, and even a town park. The nest box must be placed fairly high - 20 feet or more - in order to entice the sleek little hoverer into settling down and fiercely defending its territory with high, excited calls of, "Killy, killy, killy!"

The Great-crested Flycatcher often nests in a birdhouse instead of its natural site high in a dead tree. Curiously, this bird often lines its nest with a cast-off snakeskin. Most ornithologists reject the not implausible theory that the bird uses the skin to ward off intruders. Could it be used solely for decoration?

Another frequent box-user is the noisy, yet diminutive House Wren, familiar to most gardeners as well as birders. It inhabits farmlands, parks, and suburban gardens, and has been known to nest in mailboxes, flowerpots,

boots, an empty cow skull, and even in clothes on the line!

While some birds prefer birdboxes, others nest in roofs and the adjacent gutters and drainpipes. The roof provides height away from ground predators, while gutters provide protection all around, as does the top of a drainpipe.

When nesting in the city, the swooping Common Nighthawk, or Bullbat, utilizes flat roofs. No nest is made on this gravel surface for the two eggs, but their coloration camouflages them quite well.

The tail-wagging Eastern Phoebe now nests almost exclusively on or around buildings and bridges. It is so tame on the nest that you can almost reach in and lift the female off before she will move. The parasitic Brown-headed Cowbird, rather than building its own nest, often lays its eggs in the thick, moss-cloaked phoebe nest. The smaller flycatcher is not always fooled, however, because it sometimes abandons that nest to build a new one alongside.

The familiar American Robin will nest not only in shrubs and trees, but also on beams, girders, and ledges of all kinds. It raises a couple of broods a season in a sturdy, mud-based nest, one so durable that even during a severe winter you can still spot the whitened clay cups clinging tenaciously in a blowing snowstorm.

A common yet unpopular species about the house is the Starling. Introduced from Europe to Central Park in 1890, it spread to Nova Scotia by 1915, and by 1952 had reached Alaska! The man responsible for the introduction did so because he wanted to see birds mentioned by Shakespeare brought over to this country. Soon after the Starling arrived, attempts were made to eradicate it, for, to most people, especially the farmers, it proved to be an aggressive, gluttonous pest. It is now a permanent resident in all fifty states, and even though it is rather a handsome bird (particularly in the winter with all its light spots surrounded by iridescent green and brown), the stigma of its scientific name (*Sturnus vulgaris*) seems to have stuck.

The ubiquitous House Sparrow, also an introduced species, now prefers cornices, shutters, and sills to natural tree cavities. Although it eats some insects in the spring and summer (mostly beetles and grasshoppers), it feasts mainly on plant matter, including grain crops. This species is still spreading throughout the world due to its innate aggressiveness, adaptability, and its habit of raising 2-3 broods per year.

A final bird that nests around roofs is the raspberry-colored House Finch. Since a number were shipped illegally from California to New York City in 1940 (as "Hollywood Finches"), they have extended their range considerably in the east. They often nest in colonies in the clinging vines on buildings, and are moderately tolerant of human activity. At the school in Brookline where I live, a pair built a nest in early June, 1977, and again in May, 1978, inside a hanging, encased light fixture of an entrance portico. The befouled nest was only eight feet up, and there was much human traffic underneath, but it wasn't the commotion that did them in. A broken light bulb, left on, looming inches above the nest, apparently was the killer,

for one morning that May, I came upon the male sitting stiffly on the edge of the nest with its head to the side and slightly back, while the female darted about, peeping. Upon inspection, I received a pretty good shock from the same light fixture...all in the line of duty of being a nosy birder!

A third type of nesting area located near humans is the barn, which provides food, shelter, and nest-building materials such as chicken feathers, rope, and horse hair. The brown-eyed Barn Owl, as its name indicates, is often found in this locale, and, even if not seen, can be heard hissing and screeching. This nocturnal raptor does not make a true nest; instead, its regurgitated pellets often form the only base for its half-dozen eggs. Barn Owls should be welcomed for they consume scores of rodents, mainly rats and mice.

The beautiful and graceful Barn Swallow is another which uses barns. Unlike the lazy Barn Owl, this energetic flyer makes hundreds of trips carrying mud-balls to use as bricks for its nest. This hefty bowl is sometimes used a second year after certain alterations are done, like the addition of a new chicken-feather lining. This swallow is the farmer's friend because it regularly feeds on beetles, bugs, and flies, while on the wing, and is also a joy to watch with its acrobatic flight and its deeply-forked, streamlined tail.

A chimney can be a dangerous location for a bird to nest in, but some species, like the Chimney Swift, have adapted well -- so well that it almost never nests in caves anymore, and is one species that has increased in numbers since colonial times. Nesting and roosting in the same chimney, the swift constructs its nest of twigs held together by the bird's saliva. The brown semicircular mass is then glued to the inside of a chimney not far above the hearth, making for disastrous conditions should the fireplace be used in the summer. Rain also can destroy nests. In spite of all this, the little "flying cigar" thrives.

Finally, the Osprey will occasionally nest on unused chimneys, as well as on poles, trees, or channel buoys. This magnificent Fish Hawk, with a five-foot wingspan, builds a bulky aerie to which it often returns year after year. Unfortunately, it is still threatened by hard pesticides in the environment, taken in through the fish on which it is almost totally dependent. This excellent fisher hovers perhaps fifty feet above a still lake, then, folding its wings, swoops down talons-first at a low angle into the water. It rises, shaking itself off, with a pan-sized fish grasped head-first in its trap-like talons. This is fishing at its very best.

Human-made nesting sites, whether specifically constructed for birds or not, serve an important role in today's built-up environment. They allow certain adaptable species to find refuge in the wake of the encroaching takeover of their native habitats. Birds add more to our world than just beauty, song, and the control of insect numbers: they are handy sources of education and inspiration, and daily proof that sometimes birds and people can live together under the same roof.

TIDE CHART

Here is the tide table for Boston Harbor; add one hour for Daylight Savings Time.

1979 JULY TIDES 1979

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 3:14 Low 10:7 Sunrise 4:21	SUNDAY 15	High 3:48 Low 10:00 Sunrise 7:18	High 10:02 Low 3:48 Sunrise 4:28	SUNDAY 22	High 10:12 Low 3:54 Sunrise 7:33
High 4:13 Low 10:25 Sunrise 4:23	MONDAY 16 LAST QUARTER	High 4:47 Low 11:01 Sunrise 7:18	High 10:45 Low 4:31 Sunrise 4:28	MONDAY 23	High 10:54 Low 4:39 Sunrise 7:12
High 5:14 Low 11:24 Sunrise 4:23	TUESDAY 17	High 5:46 Low 11:02 Sunrise 7:17	High 11:26 Low 5:12 Sunrise 4:28	TUESDAY 24	High 11:36 Low 5:21 Sunrise 7:12
High 6:16 Low 12:03 Sunrise 4:23	WEDNESDAY 18	High 6:44 Low 12:23 Sunrise 7:16	High 11:26 Low 5:53 Sunrise 4:29	WEDNESDAY 25	High 12:06 Low 6:02 Sunrise 7:11
High 7:17 Low 1:07 Sunrise 4:24	THURSDAY 19	High 7:41 Low 12:21 Sunrise 7:16	High 12:17 Low 6:31 Sunrise 4:30	THURSDAY 26	High 12:45 Low 6:43 Sunrise 7:10
High 8:18 Low 2:06 Sunrise 4:25	FRIDAY 20	High 8:16 Low 1:21 Sunrise 7:15	High 12:56 Low 7:11 Sunrise 4:31	FRIDAY 27	High 1:22 Low 7:22 Sunrise 7:09
High 9:12 Low 2:58 Sunrise 4:26	SATURDAY 21	High 9:27 Low 1:52 Sunrise 7:13	High 1:36 Low 7:50 Sunrise 4:31	SATURDAY 28	High 2:04 Low 8:07 Sunrise 7:09

1979 AUGUST TIDES 1979

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 1:59 Low 8:12 Sunrise 4:47	SUNDAY 12	High 2:28 Low 8:39 Sunrise 6:50	High 8:52 Low 2:37 Sunrise 4:55	SUNDAY 19	High 9:06 Low 2:47 Sunrise 6:40
High 2:54 Low 9:05 Sunrise 4:48	MONDAY 13	High 3:23 Low 9:37 Sunrise 6:49	High 9:40 Low 3:24 Sunrise 4:56	MONDAY 20	High 9:52 Low 3:33 Sunrise 6:38
High 3:51 Low 10:00 Sunrise 4:48	TUESDAY 14	High 4:19 Low 10:37 Sunrise 6:48	High 10:23 Low 4:09 Sunrise 4:57	TUESDAY 21	High 10:33 Low 4:17 Sunrise 6:37
High 4:51 Low 10:59 Sunrise 4:50	WEDNESDAY 15	High 5:19 Low 11:39 Sunrise 6:48	High 11:00 Low 4:47 Sunrise 4:58	WEDNESDAY 22	High 11:13 Low 4:58 Sunrise 6:35
High 5:55 Low 11:56 Sunrise 4:51	THURSDAY 16	High 6:19 Low 12:37 Sunrise 6:48	High 11:37 Low 5:24 Sunrise 4:59	THURSDAY 23	High 11:50 Low 5:37 Sunrise 6:34
High 6:59 Low 12:42 Sunrise 4:52	FRIDAY 17	High 7:19 Low 12:59 Sunrise 6:43	High 12:02 Low 6:02 Sunrise 5:00	FRIDAY 24	High 12:14 Low 6:16 Sunrise 6:32
High 7:58 Low 1:43 Sunrise 4:53	SATURDAY 18	High 8:15 Low 1:57 Sunrise 6:41	High 12:28 Low 6:39 Sunrise 5:01	SATURDAY 25	High 12:50 Low 6:55 Sunrise 6:30

1979 JULY - AUG. TIDES 1979

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 2:17 Low 8:32 Sunrise 4:21	SUNDAY 29	High 2:46 Low 9:1 Sunrise 7:08	High 8:19 Low 9:1 Sunrise 4:38	SUNDAY 5	High 8:39 Low 10:7 Sunrise 7:01
High 3:02 Low 9:13 Sunrise 4:22	MONDAY 30	High 3:29 Low 9:38 Sunrise 7:07	High 9:14 Low 3:06 Sunrise 4:40	MONDAY 6	High 9:33 Low 3:20 Sunrise 7:00
High 3:47 Low 10:00 Sunrise 4:23	TUESDAY 31	High 4:16 Low 10:30 Sunrise 7:07	High 10:08 Low 3:57 Sunrise 4:41	TUESDAY 7	High 10:26 Low 4:14 Sunrise 6:57
High 4:37 Low 10:50 Sunrise 4:26	WEDNESDAY 1	High 5:04 Low 11:23 Sunrise 7:05	High 11:00 Low 4:49 Sunrise 4:42	WEDNESDAY 8	High 11:20 Low 5:05 Sunrise 6:56
High 5:32 Low 11:41 Sunrise 4:27	THURSDAY 2	High 5:55 Low 12:09 Sunrise 7:04	High 11:52 Low 5:39 Sunrise 4:45	THURSDAY 9	High 11:58 Low 5:58 Sunrise 6:54
High 6:27 Low 12:19 Sunrise 4:27	FRIDAY 3	High 6:51 Low 12:37 Sunrise 7:03	High 12:12 Low 6:29 Sunrise 4:46	FRIDAY 10	High 12:44 Low 6:50 Sunrise 6:51
High 7:23 Low 1:17 Sunrise 4:28	SATURDAY 4	High 7:44 Low 1:32 Sunrise 7:02	High 1:05 Low 7:19 Sunrise 4:47	SATURDAY 11	High 1:35 Low 7:43 Sunrise 6:50

1979 AUG. - SEPT. TIDES 1979

Morning	BOSTON	Afternoon	Morning	BOSTON	Afternoon
High 1:07 Low 7:18 Sunrise 4:21	SUNDAY 26	High 1:30 Low 7:37 Sunrise 6:29	High 6:56 Low 12:47 Sunrise 4:51	SUNDAY 2	High 7:18 Low 1:04 Sunrise 6:15
High 1:48 Low 7:57 Sunrise 4:22	MONDAY 27	High 2:08 Low 8:20 Sunrise 6:27	High 7:54 Low 1:46 Sunrise 4:51	MONDAY 3	High 8:18 Low 2:03 Sunrise 6:13
High 2:30 Low 8:39 Sunrise 4:23	TUESDAY 28	High 2:51 Low 9:05 Sunrise 6:26	High 8:51 Low 2:42 Sunrise 4:52	TUESDAY 4	High 9:13 Low 3:01 Sunrise 6:12
High 3:13 Low 9:23 Sunrise 4:24	WEDNESDAY 29	High 3:37 Low 9:53 Sunrise 6:23	High 9:46 Low 3:35 Sunrise 4:53	WEDNESDAY 5	High 10:09 Low 3:54 Sunrise 6:11
High 4:03 Low 10:13 Sunrise 4:25	THURSDAY 30	High 4:27 Low 10:48 Sunrise 6:21	High 10:39 Low 4:26 Sunrise 4:54	THURSDAY 6	High 11:01 Low 4:47 Sunrise 6:05
High 4:58 Low 11:07 Sunrise 4:26	FRIDAY 31	High 5:22 Low 11:47 Sunrise 6:19	High 11:30 Low 5:17 Sunrise 4:55	FRIDAY 7	High 11:53 Low 5:39 Sunrise 6:07
High 5:56 Low 12:07 Sunrise 4:27	SATURDAY 1	High 6:21 Low 12:07 Sunrise 6:17	High 12:07 Low 6:06 Sunrise 4:56	SATURDAY 8	High 12:20 Low 6:31 Sunrise 6:03

Tidal differences from Boston High Tide

Newburyport	31 minutes later
Scituate	5 minutes earlier
Plymouth	5 minutes later
Chatham (outside)	30 minutes later
(inside)	(1 hr) 54 minutes later
New Bedford	(3 hrs) 15 minutes earlier

BIRD OBSERVER (USPS 369-850)
462 TRAPELO ROAD
BELMONT, MA. 02178

SECOND CLASS
MAIL PERMIT
No. 369850
BOSTON, MA 02109

Virginia Howell
12 Orchard Lane
Wayland, MA 01980
