

PARK WATERFOWL POPULATIONS IN MASSACHUSETTS

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The purpose of this paper is to report on the development of park waterfowl flocks in Massachusetts and the number of waterfowl that are found in urban and park situations. Heusmann (1972) defined a park duck as a bird spending at least part of the day during part of the year in close company of humans and having access to artificial feed. By this definition, "park waterfowl" were found on both public and private land in urban, suburban, and rural settings. Some examples of the parks involved in this study are described by Heusmann and Burrell (1974).

While Black Ducks (*Anas rubripes*) are common in park waterfowl flocks and it is not unusual to observe Wood Ducks (*Aix sponsa*) or American Coots (*Fulica americana*), the predominant species is the Mallard (*Anas platyrhynchos*) (Heusmann and Burrell 1974). Prior to 1900, the Mallard was listed in New England only as a wanderer (Samuels 1870). Forbush (1925) reported that the Mallard was becoming increasingly common in the 1920's due to releases by park commissioners, sportsmen, and game keepers. A great increase in Mallards occurred after the use of live decoys was outlawed in 1935. Some hunters liberated their birds on lakes where their gunning stands were, or on ponds near their homes. Being semi-domesticated, these birds stayed in the vicinity of the release site where they were frequently fed by their former owners, or moved to bodies of water in the urbanized areas where they accepted handouts from shoreline residents. Some of our present park flocks developed from these released birds (B. French pers. comm.).

Domestic ducks and pinioned wild species are frequently kept as an attraction for visitors to municipal parks or by private aviculturalists for their own pleasure. These birds and discarded "Easter ducklings" released on park ponds formed the nucleus of other park populations.

While many of the Mallards found in flocks of park waterfowl may be descendants of released birds, Johnsgard (1959) and Johnsgard and DiSilvestro (1976) report that the Mallard is expanding its range eastward. Heusmann (1981) indicates that Mallards move in both directions between Massachusetts and midwestern America and that wild migrants may winter in park flocks.

METHODS

In January 1972, we compiled a list of locations where waterfowl were being fed. A cover letter and questionnaire postcard were sent to town conservation commissions, parks, or police departments in all towns in 7 eastern Massachusetts mainland counties asking for reports of park waterfowl. An article published in the Massachusetts' Audubon Society's *News Letter* solicited support from its members. Natural Resource Officers and Metropolitan District Commission employees were requested to census areas under their jurisdiction. Massachusetts Division of Fish

and Wildlife personnel from the waterfowl research section and district offices checked areas throughout the state.

The 1972 winter census was necessarily prolonged and the unseasonably mild weather that winter led us to repeat the survey in 1973. We then had a list of sites to be checked by the Division, but reports were again solicited from cooperators via the Audubon *News Letter* and our own *Massachusetts Wildlife*. Cooperator reports were screened to avoid duplication or error; where data were questionable, the sites were rechecked by waterfowl project personnel. Similar techniques were used in 1978 and 1983. Each survey period ran the second and third week of January. Counts were made between 09:00 and 15:30 week days by 1- and 2-man ground-survey teams. In 1983, Martha's Vineyard and Nantucket Island were censused for the first time.

During the period 29 July–2 August 1974, and 19–23 May and 30 June–3 July 1975, ground censuses were made of all existing wetlands in the greater Boston metropolitan area as delineated by Massachusetts highway 128. This area consists of approximately 837 km². Location of wetlands was determined primarily by use of 7½ min series U.S. Geological Survey topographical sheets. When newly created wetlands were known, they were also checked. Only areas indicated on the maps as possessing areas of open water were checked. Rivers and brooks could only be spot-checked in areas where ducks were likely to congregate. Each spot-check was counted as 1 area. All checks were made from vehicles or on foot except for the Charles River where a canoe was used. In 1975, age class of ducklings was recorded to prevent duplicate counts during the late spring and mid-summer counts.

RESULTS

Winter census.—The results of the 3 winter park-waterfowl censuses are presented in Table 1. Mallards comprised the bulk of the park flocks and were found on every site. Black ducks were present at half the sites, though sometimes only as a single bird. American Wigeons (*Anas americana*) were restricted to 3 sites with the largest flock on a suburban Boston high school pond. Pintails and Wood Ducks were found primarily as single birds or pairs. More unusual sightings included Green-winged Teal (*A. crecca*), Northern Shovelers (*A. clypeata*), Gadwalls (*A. strepera*), Hooded Mergansers (*Lophodytes cucullatus*), Red-breasted and Common mergansers (*Mergus seriator*, *M. merganser*), Common Goldeneyes (*Bucephala clangula*), Ring-necked Ducks (*Aythya collaris*), and Greater Scaup (*A. marila*). Coots were found on 14–15 sites each year and avidly competed for bread with the ducks. Accurate counts of Canada Geese (*Branta canadensis*) were not kept until 1983 when we counted 1976 birds at 35 sites.

We did not try to identify Mallard × Black Duck hybrids, but counted them as either Mallards or Black Ducks based on plumage. Heusmann (1981) previously noted that Mallard × Black hybrids as determined by

TABLE 1. Results of January park waterfowl censuses in Massachusetts.

	Year		
	1973	1978	1983
Mallard	9671	11,952	12,389 ^b
Black Duck	1888	1,690	1,672
American Wigeon	40	109	25
Pintail	^a	16	17
Wood Duck	^a	7	15
Coot	121	152	124
Number of Sites	116	126	132
Number of Communities	68	66	79

^a No records kept.

^b An additional 510 Mallards were reported at 8 sites on Nantucket and Martha's Vineyard.

descriptions by Phillips (1915), comprised 12% of Massachusetts winter-banded park waterfowl.

The 1978 census was more extensive than the 1973 census since we had discovered additional feeding sites in the intervening years, particularly on Cape Cod. To estimate if the winter population had increased or decreased, we compared 25 major wintering areas that were censused in both 1973 and 1978. The 1973 count was 5232 Mallards and 939 Black Ducks. The 1978 tally was 5156 Mallards and 560 Black Ducks, decreases of 1.5% and 40.4% respectively.

The 1978 and 1983 counts are comparable since coverage was only slightly more intensive in 1983. The 1983 Mallard count was 3.6% higher than 1978, while the Black Duck count was down 1.0%.

Summer census.—The greater Boston area included 143 wetlands. In 1974, at least 1 duck was observed on 57 (40%) of the areas. Mallards were found on 53 areas (37%) and Black Ducks on 27 areas (19%). One American Wigeon, 7 Wood Ducks, a number of Canada Geese, and 1 unidentified grebe were found in association with Black Ducks and/or Mallards, but none was found on areas where Black Ducks and Mallards were not found.

Totals of 2071 Mallards and 248 Black Ducks were counted in the greater Boston metropolitan area during the 29 July–4 August 1974 census. The number of ducks on the areas ranged from 1 to 311. There were 5 parks with over 100 Mallards present. Only 2 large concentrations of Black Ducks were discovered: 39 birds on a pond north of Boston where Black Ducks were the only species present, and 42 Black Ducks and 40 Mallards in a Boston cemetery.

We compared the summer 1974 findings with census data from the winter of 1973. During January of 1973, in the same area, 3443 Mallards and 687 Black Ducks were counted. The winter survey was not as intensive as the summer survey, but since many areas were frozen over,

TABLE 2. Number of waterfowl broods observed on 143 Boston area wetlands in 1975.

Species	Number of broods	Total number of ducklings	Number of areas with broods
Mallard	232	585	54
Black Duck	13	60	5
Wood Duck	7	30	6
	141	675	59 ^a

^a More than 1 species used some areas.

probably few areas harboring ducks were missed. Assuming the same 143 wetland areas were available to ducks (barring ice conditions) 22% (32) of the areas were used by Mallards and 13% (19) by Black Ducks. Flock sizes ranged from a low of 10 to a high of 550. Many areas with summer flocks had had larger winter flocks, but some summer areas, including 2 of the largest (Boston Public Gardens and Brookline Reservoir) were frozen over and harbored no waterfowl during January 1973. On the other hand, an area in Beverly had 25 Mallards and 4 Black Ducks on it during the summer census, but harbored 460 Mallards and 90 Black Ducks when censused during the winter of 1973. A few areas with no summer ducks were used as wintering areas. There were 40% fewer Mallards and 64% fewer Black Ducks observed in the greater Boston metropolitan area during the 1974 summer census than were observed during the 1973 winter census.

The 2 censuses conducted in 1975 were aimed at estimating the number of broods present in the Boston area. All 143 wetlands checked during 1974 were checked in 1975. The number of broods per site varied from 0 to 18. Broods were observed on 59 (41%) areas while waterfowl were seen on 82 (57%). Broods ranged in size from single ducklings (8 broods) to 11 ducklings (2 broods). Four- to 6-duckling broods were the most common (N = 48 broods) (Table 2).

Broods were observed on all types of habitat from small ponds of a few hundred square meters to large lakes and major rivers. Some areas were densely vegetated, while others were open ponds surrounded by mowed park lawns.

DISCUSSION

Winter census.—During the course of the 10-year census period, we discovered that some park flocks disappeared while others were created or greatly expanded. In situations where flocks diminished, the usual reason was cessation of artificial feeding. At Beaver Brook Reservation, Waltham, 100 Mallards and 15 Black Ducks fed along with the assorted domestic ducks and geese in 1973. The domestic birds were removed the following fall and regular feeding ceased. The next winter, only a couple dozen Mallards used the area and in 1978 no birds were present. In nearby Newton, grocery warehouse workers were feeding 25 Mal-

TABLE 3. Effects of freeze-over on 5 neighboring park waterfowl sites.

Site	Number of waterfowl			
	January 17		Overnight freeze	January 18 ^a
	Mallard	Black Duck	Mallard	Black Duck
Wedge Pond	10	0	0 (frozen)	0
Leverett Pd.	70	18	230	18
Muddy River	29	57	10	21
Boston Fens	75	0	0 (frozen)	0
Beacon Street	not checked		0 (frozen)	0
Totals	184	75	240	39

^a 1 Greater Scaup and 1 Hooded Merganser appeared on Leverett Pond on this date.

lards and 10 Black Ducks in 1973. The site was checked in 1978 and the warehouse had been converted into a skating rink; only 2 Black Ducks were seen.

Other park sites were newly established. The Franklin Park Zoo was under renovation in 1973 and did not maintain an outdoor waterfowl collection. The waterfowl pool was restored by 1978 and we counted 320 Mallards and 130 Black Ducks mixed with the Zoo's captive flock.

The importance of artificial feeding to metropolitan waterfowl flocks was also demonstrated in the Minneapolis-St. Paul, Minnesota area. Handouts or regularly-provided food were common to 29 of 39 sites where waterfowl wintered (Cooper and Johnson 1977).

Open water is also important to park flocks. During periods of severe cold, park birds may be frozen out of a park and forced onto open rivers or salt water. Frequently, however, they merely move to another park. During the middle of the 1983 census, a 3-day cold spell froze over many ponds in the Boston area. Heusmann checked ponds in the Brookline-Boston area on 17 January, but was unable to visit 1 site on Beacon Street in Brookline. That night temperatures dropped to -20°C . When he checked the Beacon Street site on 18 January, he found it had frozen over during the night and no ducks were present. He then rechecked neighboring sites and found 2 more ponds frozen and birds concentrated at one pond (Table 3). All the sites were within a 2 km radius.

P. Rachalski (pers. comm.) of Boston reported approximately 120 ducks he was feeding along a brook in his back yard moved to the nearby Neponsett River during the same cold snap but that about 65 had returned a few days later when the brook began to thaw. We have observed previous back-and-forth movements in other areas in response to ice conditions.

Summer census.—Our summer brood surveys likely missed some broods and we believe actual production was higher than the data indicate.

Reports from local residents and park visitors, however, indicate that duckling mortality was also high. We counted 2525 Mallards during the 1975 summer census; the 585 ducklings (Table 2) observed comprised only 23% of the Mallard population. Several people we interviewed during our brood surveys expressed opinions that snapping turtles (*Chelydra serpentina*) were a major duckling predator. We previously reported that gulls (*Larus* spp.), rats (*Rattus norvegicus*), domestic dogs, and people were involved in destruction of nests and broods (Heusmann and Burrell 1974). Our observations on areas where park waterfowl concentrated led us to conclude that inattentiveness on the part of hens also was involved in duckling mortality.

Figley and VanDruff (1974) reported that Mallards which nested in New Jersey lagoon developments produced larger clutches than marsh-nesting Mallards, possibly due to dump nesting, and that nesting success was highest in the developed lagoons. Mallard broods in marshes, however, had a better survival rate than lagoon broods due, in part, to the complete loss of many broods in the lagoon areas during the first 2 weeks after hatching. Figley and VanDruff (1974) attributed the severe brood loss to lack of escape cover, poor invertebrate food supplies, manmade hazards, harassment of hens and broods by unpaired drakes and by people, and night-light-banding activities.

Conclusions.—Park waterfowl populations are not unique to Massachusetts. Goodwin (1956) reported on park waterfowl in Toronto and Park Mallards have wintered as far north as Anchorage, Alaska (Anonymous 1976). Cooper and Johnson (1977) and Green and Cooper (1979) surveyed waterfowl in the Minneapolis-St. Paul area. Hardin and VanDruff (1978) observed urban park waterfowl in New York, while Figley and VanDruff (1981) reported that studies on urban waterfowl have been conducted in London and Stockholm as well as Illinois, Pennsylvania, New Jersey, and Connecticut.

Our winter survey data indicate that over 12,000 Mallards winter in Massachusetts on sites where they are fed and that total park waterfowl populations (including ducks, geese, and coots) exceed 16,000 birds. Winter census data indicate that Mallard populations have been stable over the past 10 years. Black Ducks may be slightly declining.

Parks are important in the ecology of the Mallard in the Northeast. Heusmann (1974) indicated that most of the Mallards that wintered in Massachusetts did so in park situations. Band recovery data, corrected for band reporting rates, indicate that 89% of pre-season-banded park Mallards and 75% of Mallards pre-season banded on wild areas are recovered within 80 km of their point of banding (Heusmann 1981). The relative lack of out-of-state migration combined with the concentration of Mallards in parks during the winter indicate that most Mallards in the state depend upon the parks sometime during the year.

Northeastern North America is the traditional home of the Black Duck. The increase in Mallards and decline in Black Ducks in this area had been documented by Collins (1974) and Johnsgard and DiSilvestro

(1976). Heusmann (1974) commented on hybridization between the species and reported that park flocks had a larger proportion of hybrids than did wild flocks. We believe that the ecology of the Mallard in Massachusetts and, indeed, the rest of the Northeast is closely tied to the phenomena of parks and the artificial food supplies available to park waterfowl.

SUMMARY

Park waterfowl populations, primarily Mallards (*Anas platyrhynchos*), began developing in Massachusetts in the late 1930's. Currently, more than 16,000 waterfowl winter in Massachusetts parks and park-like situations. Nesting in and around parks is extensive, but brood survival is poor. The role of parks in the ecology of the Mallard in the northeast is a key to the Mallard's recent incursions into the Black Duck's (*A. rubripes*) traditional range.

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