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INFLUENCE OF WINTERING MALLARDS ON HYBRIDIZATION IN AMERICAN BLACK DUCKS

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Abstract.—Hybridization between American Black Ducks (*Anas rubripes*) and Mallards (*A. platyrhynchos*) was higher where the two species wintered in similar coastal habitat than where Black Ducks were isolated. The rate of hybridization increased as the number of Mallards wintering in an area increased.

LA INFLUENCIA DE *ANAS PLATYRHYNCHOS* EN LA HIBRIDIZACIÓN CON *ANAS RUBRIPES*

Resumen.—Se encontró que la hibridización entre *Anas rubripes* y *A. platyrhynchos* es mayor en áreas de hábitat costaneros, en donde estas especies convergen para pasar el invierno, que en áreas en donde no está presente la segunda especie. A mayor número de *A. platyrhynchos* en los lugares en donde ambas especies pasan el invierno, mayor fue el número de hibridos encontrados.

Hybridization between Mallards (*Anas platyrhynchos*) and American Black Ducks (*A. rubripes*) has been suggested (Ankney et al. 1987, Heusmann 1974, Johnsgard 1967, Spencer 1980) as one of the causes for the decline of the Black Duck over the past 30 yr (Steiner 1984). Ankney et al. (1987) hypothesized that many hybrids resulted from mixed matings occurring during renesting efforts on the breeding grounds. This paper presents examples of how Mallard-Black Duck contact on wintering areas can also influence hybrid ratios.

Previously, I suggested that the maritime proclivities of the Black Duck limited its contact with wintering Mallards during a time of year important in pair bond formation, thus reducing chances of hybridization (Heusmann 1974). While Mallards may utilize salt marsh habitat during summer months, they desert it for fresh water sites in the winter (Heusmann 1987). Past surveys in Massachusetts indicated that 90% of the Black Ducks counted wintered along coastal areas while 95% of the Mallards wintered on inland sites (Heusmann 1974). R. E. Kirby, P. Dupuis and G. L. Hensler (pers. comm.) point out that because extensive tracts of salt marsh are now limited in the U.S. and because there are numerous concentrations of Mallards in coastal developments, the habitat isolation formerly enjoyed by Black Ducks is reduced. I offer two examples of how the presence of Mallards near or in Black Duck wintering habitat in coastal Massachusetts affects hybrid ratios.

During January and February of 1981 and 1982, Massachusetts Division of Fisheries and Wildlife personnel banded Black Ducks in Norman's Woe Cove, on Cape Ann (Table 1). Included in the bandings were 13 ducks of at least partial Mallard ancestry as determined by Phillips (1915) description. No Mallards were banded and previous inventories of Mallards indicated that few Mallards were wintering on Cape Ann

TABLE 1. Comparison of numbers of Black Ducks, Mallards, and hybrids banded at a wintering site with no contact with Mallards from local parks (Cape Ann), and a wintering site with interchange of Mallards from local parks (Lynn Harbor).

Species	Site (banding years)	
	Cape Ann (1981–1982)	Lynn Harbor (1978–1986)
Black Duck	309	292
Mallard	0	7
Black × Mallard	13	45
Hybrid : Black ratio	1:24	1:6.5

(Heusmann and Burrell 1984). Recaptures at Cape Ann of ducks banded at the coastal Parker River National Wildlife Refuge 13 km northwest of the cove and subsequent recoveries of Cape Ann birds at Parker River indicated that the Cape Ann ducks wintered primarily in the salt marsh habitat around the refuge and moved to Norman's Woe Cove when the salt marsh froze over.

During the winters of 1978–1986 we also banded waterfowl at Lynn Harbor, 30 km down the coast, southwest of Cape Ann. Whereas there were no Mallards wintering in city parks on Cape Ann, a flock of about 400 Mallards and 40–90 Black Ducks wintered at Flax Pond, a feeding site 3.8 km inland from Lynn Harbor. Our banding work at Flax Pond and Lynn Harbor indicated an interchange of Black Ducks and, more rarely, Mallards, between the fresh water and salt water sites. The ratio of hybrids to Black Ducks was significantly higher ($P < 0.001$, $Z = 4.65$) at Lynn Harbor than it was at the Cape Ann site (Table 1). The proximity of park waterfowl to a Black Duck wintering site appears to have influenced hybridization between the two species by affecting pair formation. Brodsky and Weatherhead (1984) observed mixed flocks of Mallards and Black Ducks wintering at an urban site near Ottawa, Ontario. They noted that Mallards began courtship before Black Ducks did; and after all the female Mallards were paired up, the unpaired Mallard drakes joined Black Duck courtship groups. Many unmated Black Duck hens selected Mallards for their mates. Similar events may have occurred in the Flax Pond/Lynn Harbor area.

The second example of the impact of Mallards wintering in Black Duck habitat is chronological. Hill (1965) reported scattered breeding pairs of feral Mallards on Cape Cod and scattered wintering birds, usually associated with Black Duck flocks. By 1983, a park waterfowl census indicated more than 1000 Mallards were wintering on Cape Cod (Heusmann and Burrell 1984). Table 2 compares numbers of Mallards, Black Ducks and hybrids banded over a 20 yr span in the Nauset Marsh-Pleasant Bay area on outer Cape Cod. The ratio of hybrids to Black Ducks was significantly higher ($P < 0.001$, $Z = 5.97$) in recent years than in the early 1970s, a direct reflection of the increase in Mallards wintering on Cape Cod.

TABLE 2. Comparison of numbers of Black Ducks, Mallards, and hybrids banded at wintering sites on outer Cape Cod, Massachusetts.

Species	Years banded	
	1967, 1971–1974	1982, 1984–1987
Black Duck	687	675
Mallard	9	47
Black × Mallard	56	130
Hybrid : Black ratio	1:12	1:5

The increased rate of hybridization has not been restricted to Cape Cod. Banding data by Massachusetts Division of Fisheries and Wildlife personnel indicate that during the winters of 1971–1974, 8.1% of the Black Ducks and Mallards banded along coastal Massachusetts were hybrids. By 1979–1982, that figure had increased to 15.9% (Heusmann 1985). Most recently (1984–1987) hybrids comprised 18.8% of the ducks banded by Division personnel on coastal sites (Division files). The increase in hybrids parallels increasing numbers of coastally wintering Mallards. Mallard counts on Massachusetts coastal mid-winter inventories averaged 670 during 1971–1974, 1200 during 1979–1982 and 1935 during 1984–1987 (Division files). Most of these Mallards winter in estuaries and around marinas where people feed them. Mallards have been wintering in increasing numbers throughout the Northeast during the past 30 yr (Heusmann 1987).

These examples demonstrate that when Mallards and Black Ducks winter on or near the same area, hybridization between the two species increases. The examples support the contention expressed by Kirby, Dupuis, and Hensler that Black Ducks along the U.S. coast may no longer be reproductively isolated from Mallards by differences in winter habitat.

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