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Cover Photo: Volunteers at Gateway NRA (New York City) place brush in created freshwater pond to provide cover and calling sites for introduced Spring Peepers. Story page 3.

Representative Animal Community Being Created at Jamaica Bay

By Robert Cook

The Jamaica Bay Wildlife Refuge, a part of Gateway NRA, consists of 9,155 acres of saltwater bay, marsh, and upland habitats scattered among 25 islands in southern Brooklyn and Queens, New York City. Established in the early 1950s by the City Department of Parks, the National Park Service took over the Refuge's management in 1974 with the establishment of Gateway.

Traditionally, refuge management has focused on birds; techniques such as impoundments, water level manipulation, and food and cover plantings have been quite successful. Nearly 320 bird species have been recorded.

Contrasting sharply with such avian diversity is the scarcity of amphibians and reptiles (collectively known as herpetofauna) in the refuge. Of course, there are fewer species in these taxa to begin with, but other factors also have contributed to their paucity here. Their mobility is limited, so dispersal is a slow, difficult process. Originally, the islands of Jamaica Bay were all salt marsh. During this period the herpetofauna of the surrounding Brooklyn-Queens mainland were numerous and diverse. However, because of the unsuitability of salt marsh as habitat for most "herps," few species occurred in Jamaica Bay itself. In this century, dredging and landfill have created new upland and freshwater habitats on some of the Bay islands. At the same time, urbanization was eliminating most of the mainland's original herpetofauna and reducing the remaining species to remnant populations. Thus, three factors — restricted movement ability, habitat changes in and around Jamaica Bay, and the insular nature of Jamaica Bay Wildlife Refuge — have combined to produce a herpetofauna less diverse than the presently available habitats of Jamaica Bay might be expected to support.

In 1979 efforts began to inventory and determine population status of the Refuge's herpetofauna. So far, three species have been determined to occur as breeding populations. These are Fowler's Toad (*Bufo woodhousei fowleri*), Eastern Garter Snake (*Thamnophis s. sirtalis*), and the Northern Diamond-back Terrapin (*Malaclemys t. terrapin*). The first two are still common along the Bay's periphery, while the terrapin is basically restricted to salt marsh and hence, has always been present. Four other species also have been relocated. The Snapping Turtle (*Chelydra serpentina*) may represent remnants of an indigenous salt-marsh dwelling population; the Eastern Painted Turtle (*Chrysemys p. picta*), the Eastern Box Turtle, and the exotic Red-eared Slider (*Chrysemys scripta elegans*) are most likely released pets.

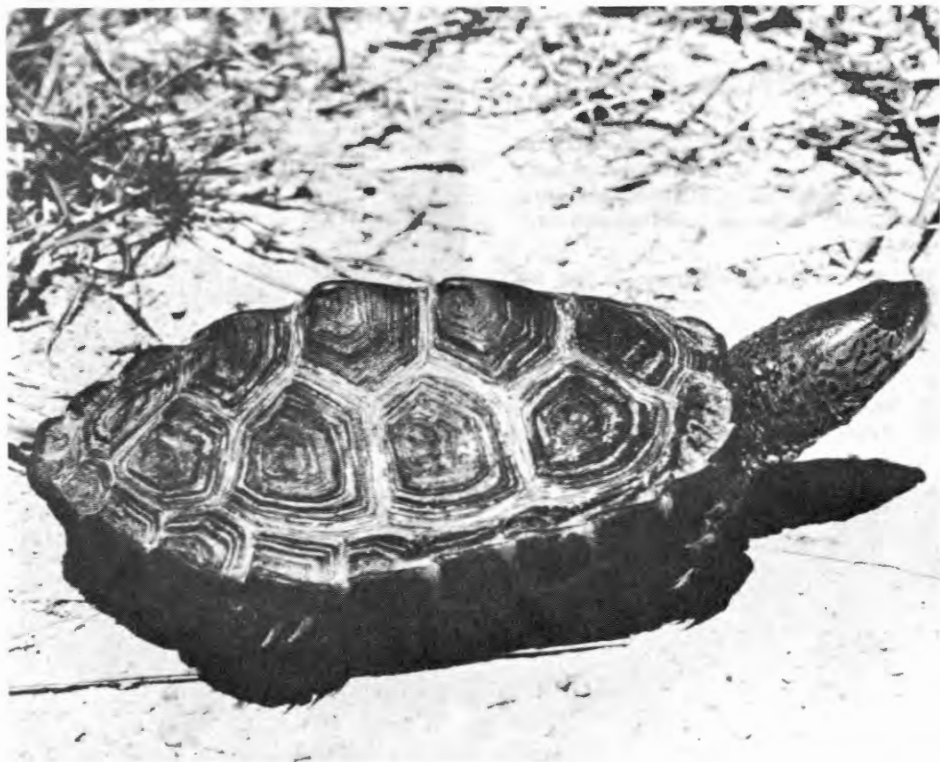
Following inventory a two-phased plan was developed, calling for habitat improvements and introduction of regionally native species suited to the habitats originally and newly present. While intentional introductions of a non-native species into natural ecosystems generally are frowned upon by biologists and by National Park Service policy, the unique circumstances of Jamaica Bay within the New York metropolitan area justified such a course. In manag-

ing Jamaica Bay as an ecosystem where natural processes are to be preserved and restored, park managers envisioned establishing an animal community as representative of area-wide pre-urbanization conditions as desirable.

The introductions serve two purposes. First, they will create a more diverse animal community, with more complex food webs and greater ecological stability. Secondly, considering urbanization trends, the fate of many remnant populations is much in doubt. With the extirpation of these remnants, the local forms of many species would exist only as museum



An NPS technician releases Spring Peeper tadpoles into freshwater habitat at Jamaica Bay Wildlife Refuge. The Northern Spring Peeper (above) was collected at JFK Airport to help establish a population of this species at JBWR. Photos by Robert Cook and Don Riepe.



Northern Diamondback Terrapin is an estuarine turtle common in the salt marshes throughout Gateway NRA.

specimens, and the living gene pools they represent would be gone. Here at Jamaica Bay, and throughout Gateway, we have habitats relatively devoid of animals, while throughout the Long Island area, there

are remnant animal populations running out of habitat, with no chance of finding new habitats on their own.

In the spring of 1980 the program began, with

habitat improvements as the first step. Such work for amphibians and reptiles is based on the same principles as applies to birds and mammals: to provide food, water, cover, and any other special life requirements. Small freshwater ponds were created by hand using high school student volunteers or, in one case, with a bulldozer. Aquatic plants and brush were added to provide food cover, perches, and egg deposition sites for amphibians.

Driftwood boards were relocated unobtrusively in meadows and woodlands as cover for snakes, toads, frogs, and their prey. Piles of leaves (disposed of each fall by urbanites) and wood chips (refuse from urban street tree maintenance efforts) were situated to provide cover and hibernating and nest sites.

Having effected habitat improvements, the introduction of herps was begun, according to self-imposed restrictions on what is to be introduced. First, a list of 14 potential species was developed, with introductions to start with species of the lower trophic orders and to end with higher order predators. Secondly, animals had to be obtained locally, since Long Island is a distinct zoogeographical entity. Finally, populations from which collections were to be made either already had to be faced with extirpation or had to be large enough to sustain collecting without becoming extirpated. The goal was not to wipe out one population to establish another.

The amount of field work required for this type of project can be tremendous. Collecting is time consuming and there are many unknowns, foremost of which is "How many individuals are necessary to establish a breeding population of a given species?"

Since 1980, the project effort has concentrated on three species. Breeding pairs of Spring Peepers (*Hyla c. crucifer*) were collected on April nights from the freshwater marshes adjacent to the runways of nearby Kennedy Airport and released into the freshwater ponds of Jamaica Bay. Later on, tadpoles were netted at the airport and similarly released in Jamaica Bay.

Twenty-five Northern Brown Snakes (*Storeria d. dekayi*) were released in one secluded part of the refuge. Recaptures of marked individuals have shown survival after two months, but it still is too soon to know whether or not a breeding population exists.

Lastly, Eastern Box Turtles have been collected from a parcel of land in nearby Suffolk County slated for sub-division – the beginning of the end as far as the box turtle population is concerned. Finding these animals has been a slow process in which chance is a big factor, so it will take several years to complete work on this species.

This program to enhance an animal community is not one where dramatic results will occur overnight. Many more years of collecting, marking, and monitoring these animals and their habitats will be necessary to accomplish the overall objective – establishment of a balanced, self-perpetuating animal community as representative of pre-urban New York as possible. Considering trends in population growth and urban development, Jamaica Bay Wildlife Refuge and other Gateway natural areas may someday be the only places left in New York City where visitors can experience the native wildlife of the area.

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