Conservation of the Green Heron (*Butorides virsescens*) on Bermuda

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Abstract

The Green Heron (*Butorides virescens*) colonized Bermuda as a nesting species in the early 2000's. Although potential colonists had been observed over the years, it appears that successful colonization occurred after, and likely as a result of, habitat protection and improvement. Habitat creation, management, and conservation were accomplished through the actions of several organizations. This case history is offered as a model of the potential value of habitat conservation planning and action, which in this case enhanced the probability of increasing biodiversity of the island.

Key words: Ardeidae; Caribbean; colonization; habitat; range extension; wetland restoration; wetlands.

Introduction

The Green Heron (*Butorides virescens*) is a relatively new addition to the nesting avifauna of Bermuda. Wingate *et al.* (2005) documented the colonization and subsequent population expansion through 2007. The Green Heron was first observed nesting in 2002; and by 2006 and 2007, the number of Green Heron nests on Bermuda stood at about 20 annually, and they were nesting at up to seven sites. Green Herons had been observed on Bermuda in the past, particularly in winter (Wingate *et al.* 2005). However, no nesting had been recorded. The question as to why the successful colonization could occur is an important one, as its answer could provide information of value to heron conservation elsewhere. In this note, we suggest why.

Methods

Bermuda is an oceanic archipelago in the North Atlantic Ocean, about 900 km from North America. Despite its northern position, its climate is temperate to semi-tropical due to the warming effects of the Gulf Stream. Field studies to determine the status of the Green Heron in Bermuda were undertaken in from 2003 to 2007 and are documented in Wingate *et al.* (2005). Information

Figure 1. A newly constricted pond and wetland, restoring wetland conditions at the site and providing enhanced habitat for waterbirds.

on habitat conservation action is based on the personal observations of the authors, two of whom were actively involved in these activities over many years.

Results and Discussion

As of 2007, Green Herons nested in at least 7 sites. Within the Bermudan context, at least three of these would qualify as Important Bird Areas for the species in Bermuda. Bermuda has only 10 natively-nesting bird species. Thus the Green Heron's addition to the avifauna is not an insignificant event for the nation's biodiversity, as it increased the diversity of native nesting species by 10%. Moreover, natural colonization of an island is a rare event and one that is seldom documented. It is significant that this colonization has been thoroughly documented by the Bermuda Audubon Society (Birdlife in Bermuda) and the Department of Conservation Services of the Ministry of the Environment.

Early records suggest that several species of heron were nesting on Bermuda in pre-colonial time. However, the cumulative impact of human settlement over 400 years, culminating in a human population of over 60,000 on an island of only 60 Km^2, has had a dramatic effect on native

Figure 2. Golf Course pond, a nesting site for Green Herons in Bermuda.

waterbirds. Hunting by food-challenged colonists no doubt began the process of waterbird population decline and extirpation. Evidence for a decrease in nesting bird species in the early centuries following human colonization, although anecdotal, is strong. Then over the centuries, most wetland habitats were destroyed through dredging and reclamation for farmland, industrial sites and solid waste disposal. These two processes appear to have been responsible for the elimination of resident heron populations, as there were no confirmed records of heron nesting between the advent of scientific documentation of Bermuda ornithology in the mid-19th century and the mid 1970's.

Similarly, two processes appear to have been responsible for the return of herons to Bermuda. The first was a species conservation program, the deliberate introduction of the Yellow-crowned Night Heron (*Nyctinassa violacea*) in 1976-78 as a substitute for an endemic night heron that had been exterminated at the beginning of Bermuda's human settlement (Wingate 1982). This introduction took well, and the night heron has since established nesting colonies in remnant wetlands and offshore islands. Bermuda has always served as a stop-over or wintering area for North American herons, but prior to the establishment of the night heron none stayed to nest. We suspect that the presence of nesting night herons may have

facilitated the colonization of the Green Heron by enticing wintering birds to stay on into the summer nesting period. Green Herons first nested in sites already occupied by nesting night herons.

The second process leading to the successful establishment of herons on Bermuda was habitat conservation. Habitat conservation measures were initiated in the 1950's when two local non-government conservation organizations, the Bermuda Audubon Society and the Bermuda National Trust, began to lobby government to end the destruction of wetlands and launched fund raising drives to acquire, restore and manage those wetlands that remained. Their efforts were later bolstered by Government initiatives, the most important being protective zonings and the cessation of garbage dumping in the marshes after 1983. Bermuda is now a party to the Ramsar Convention and several wetlands, although small by world standards, have already been declared as Ramsar sites. Others are proposed. Restoration and management measures, most notably the culling of invasive exotic species, are being undertaken by a Conservation Unit within the Conservation Services department of the Ministry of the Environment. Importantly, wetlands are being restored and ponds being created at their former sites, all of which will proved habitat for aquatic birds (Fig. 1).

Since 1950 more than half of Bermuda's remaining wetlands have been acquired from private ownership and managed as nature reserves. Restoration efforts on them as of 2008 have resulted in the creation of eight new ponds with nesting islets and nine other open water areas including water trap ponds and irrigation reservoirs on golf courses. As this type of habitat is optimal for both Yellow-crowned Night Heron roosting and nesting and for Green Heron roosting, nesting and foraging, it seems highly probable that these conservation efforts have been a major factor enabling their recent colonization. The first nesting site discovered was at a pond under private management, in a golf course (Fig. 2). Another site is a pond surrounded by homes. Green Herons are often seen feeding in and flying among restored ponds. So it is clear that Green Herons are using the freshwater wetland habitats that are available to them on the island.

The story of heron colonization might not end there as several other regularly visiting heron species have the potential to recolonize. Other waterbirds, notably American Coots (*Fulica americana*), Common Moorhens (*Gallinula chloropus*), and Pied-billed Grebes (*Podilymbus podiceps*) have also benefitted from these restored wetlands as their nesting populations have grown and become more widespread.

Although these observations do not prove a cause and effect relationship, they are strongly indicative. It would seem that hard to contradict the position that without the protection and management of these wetland habitats, the Green Heron would not have been able to successfully colonize as a nesting species.

These species management and intensive wetland conservation efforts on Bermuda involved engagement and close cooperation among local NGOs, the Government, and private land owners. This multi-organizational engagement provides an example of conservation that can be argued to have proven successful in increasing biodiversity of the resident avifauna.

This example may be applicable to the wider Caribbean, where many of the most important wetland areas are in private ownership and both habitat and species conservation is in some cases urgently necessary. Most of the small islands of the Caribbean have few natural wetlands and ponds, and those that do exist have been highly altered, as were those on Bermuda by centuries of human occupation, especially agriculture and

dumping. By way of example, the Little Egret (*Egretta garzetta*) colonized the Western Hemisphere by establishing a nesting population of Bermuda, which has since further colonized Antigua (Massiah and Frost 1998, Kushlan and Prosper 2009). The conservation situation for both these populations is dire (Kushlan *et al.* 2007).

They nest in only one site on each island and both are under development pressure, and these sites are among the very few that remain on each island. Preservation, protection, and management of these sites are likely required to assure the continued persistence of the Little Egret as a breeding species in the hemisphere. The similarity in the situation for the Green Heron in Bermuda and the Little Egret in Barbados and Antigua suggests a commonality of issues for herons throughout the Caribbean. Wetlands, including ponds, of particular value to herons, continue to be under threat throughout the Caribbean and will persist only through protection and management by a combination of government and private interests.

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