Great Blue Heron

Ardea herodias

DESCRIPTION

The great blue heron is one of the largest and most widespread wading bird in North America. It is one of two subspecies recognized on the continent, the second one being the great white heron (*Ardea occidentalis*) of Florida. The white herons freely interbreed with blue herons, producing an intermediate form called Würdemann's heron of the Florida Keys (Butler 1992). This account will focus on *A. herodias*, the only subspecies that occurs in the Housatonic study area.

BODY SIZE

The adult great blue heron is a large bird, standing up to 60 cm tall or more and measuring 97 to 137 cm long. Adults weigh between 2.1 and 2.5 kg. The wings are long and broad, and the tail short. In flight, the long neck is doubled back in an S-shape and the head rests against the shoulders. The legs and bill are also long (Tufts 1986, Butler 1992).

In The Primary Study Area: No great blue herons were captured or collected in the Housatonic study area, and no site-specific or regional body size data were found.

DISTRIBUTION

The breeding range of the great blue heron is extensive, ranging from the southern Canadian provinces to southern Mexico (Figure 1). Wintering and permanent range includes southeastern Massachusetts south along the coastal states and west across the south half of the U.S. into Mexico and northern South America. Depending on weather severity, a small number may spend the winter (or a portion of it) near unfrozen rivers and tidal wetlands of New England. In Massachusetts, wintering great blue herons are largely limited to outer Cape Cod and Nantucket (Laughlin and Kibbe 1985, Butler 1992, DeGraaf and Yamasaki 2001).

Photo by: Scott Robinson

Figure 1. Range of the great blue heron in North America

MIGRATION

Most great blue herons breeding in the northern regions of the range, including the Housatonic study area, migrate southward in winter and northward in summer. Southward migration from northern portions of the breeding range begins in September and October, though some birds are recorded annually in Canada in December. Herons begin returning to the New England region in mid-

March. Overall, migration chronology is not well understood, and little information is available on migration routes or migratory behavior. They most likely winter along ice-free rivers and coastal areas, though banding studies suggest many may winter in the Caribbean. Great blue herons usually migrate alone or in small groups, but also occasionally in larger flocks of up to 100 (Palmer 1962, Butler 1992, DeGraaf and Yamasaki 2001).

HABITAT

In the breeding season, great blue herons inhabit many different wetland community types. They feed primarily in shoreline areas associated with lakes, ponds, beaver flowages, slow-moving freshwater streams, and estuaries, though they are occasionally found in shallow coastal marine habitats and fields. Great blue herons typically nest in tall trees near water, but may also build nests on the ground, on rock ledges and sea cliffs, or in shrubs when trees are not available. They are typically colonial nesters but may also be solitary. The nest sites are often located on islands or in swamps, presumably to avoid land predators. Some nest sites are located far from food sources.

In New England, great blue herons prefer nesting near inland freshwater habitats rather than salt water (Butler 1992, DeGraaf and Yamasaki 2001).

In The Primary Study Area: Table 1 contains a summary of the literature review and observational data on the use by great blue herons of the natural community types found within the primary study area.

Little information is available on the habitat use of great blue herons on the winter range. Along the east coast, they prefer salt marshes and other coastal marine habitats. In Okalahoma, they appear to prefer natural wetlands and riverbanks over farm ponds. In the coastal northwest (British Columbia), the females and juveniles feed in estuaries and nearby grasslands, while the males set up territories along riverbanks. Habitat use by great blue herons during spring and fall migrations is probably similar to that of the breeding season (Butler 1992).

HOME RANGE AND TERRITORIALITY

Results of studies from the midwestern and western states show that mean distances from nesting

Table 1. Habitat use by great blue herons in the Housatonic study area

Habitat Codes and Natural Community Classifications																			
Wetland Habitats												Terrestrial Habitats							
ROW	ROW & PAB	SHO		PFO				PSS	PEM		WM	VP	SW	MW	HW			OF	AGR	RES
Medium-gradient stream	Low-gradient stream	Riverine pointbar and beach	Mud flat	Red maple swamp	Black ash-red maple-tamarack calcareous seepage swamp	Transitional floodplain forest	High-terrace floodplain forest	Shrub swamp	Deep emergent marsh	Shallow emergent marsh	Wet meadow	Woodland vernal pool	Spruce-fir-northern hardwood forest	Northern hardwoods-hemlock-white pine forest	Successional northern hardwood forest	Red oak-sugar maple transitional forest	Rich mesic forest	Cultural grassland	Agricultural cropland	Residential development
	B	B	B	B	B	B	B	B	B	B	B	B								

ROW = Riverine Open Water
SHO = Shorelines
PFO = Palustrine Forested
PSS = Palustrine Scrub-Shrub
PEM = Palustrine Emergent
WM = Wet Meadow
PAB = Palustrine Aquatic Bed
VP = Vernal Pool
SW = Softwood Forests
MW = Mixed Forests
HW = Hardwood Forests
OF = Open Fields
AGR = Agricultural Croplands
RES = Residential

Season of Use
B = Breeding
M = Migration
W = Wintering
Y = Year-round
Shading = observed in study area

colonies to principal foraging grounds ranged from 2.3 to 6.5 km. Some breeding adults range as much as 30 km from the colony, but most stay much closer. Little is known about home range sizes outside the breeding season (Butler 1992).

Great blue herons can be territorial or nonterritorial, depending on age, sex, or time of year. Defense is by threats, displays, or chasing. Adult females and juveniles are not territorial at feeding areas during winter. Adult males defend feeding territories year round, females mostly during nesting season. Breeding pairs defend the immediate vicinity of their nest (i.e., where they can reach with their bills without leaving the nest). Feeding territory sizes are variable, probably dependent on the quality of the habitat in regard to forage type and availability. Shoreline territories in feeding areas in an Oregon estuary (n = 32) had a mean shoreline length of 355 m (SD = 168) and a mean area of 8.4 ha (SD = 5.4). Territories in a freshwater marsh (n = 7) had a mean shoreline length of 129 m (SD = 28) and a mean area of 0.6 ha (SD = 0.1). Nonterritorial herons from neighboring colonies have overlapping foraging grounds. Great blue herons forage and roost alone or in loose flocks (Butler 1992).

BREEDING

Great blue herons are primarily colonial nesters. The communal nest sites are often called rookeries. Great blue heron colonies sometimes share nest sites with other colonial species such as the black-crowned night heron (*Nycticorax nycticorax*) and the double-crested cormorant (*Phalacrocorax auritis*), in which case the great blue herons take possession of the tops of trees (Canadian Wildlife Service 1990).

Great blue herons are mostly monogamous, but choose new mates each year. Males arrive at the nests first, and pair formation follows elaborate courtship displays. Nests are usually located in the upper portions of tall trees (up to 130 feet), and are constructed of branches and lined with vegetation (i.e., pine needles, grass, moss, leaves). Both coniferous and deciduous trees are utilized for nest sites. Site selection for the nest colony is most likely based on distribution of foraging habitats, but may also be influenced by protection from mammalian predators. Individual nests can be closely spaced within the colony, often several in the same tree. Old nests may be repaired for use each season, though nest-site fidelity is weak year to year. Older nests are generally larger than new ones because they are continually added to. Some colonies are used for decades (Butler 1992). Colonies can contain up to 2000 birds, but more commonly contain dozens to a few hundred.

Clutch size varies from 3 to 7 eggs, but 4 is typical (DeGraaf and Yamasaki 2001). Great blue herons produce one clutch per year. Eggs are laid in intervals of about 2 days. Typical fresh weight of eggs is about 65 – 75 g. Both males and females take part in incubation. The incubation period is about 27 days. Adults throw eggshells out of nest soon after hatching.

GROWTH AND DEVELOPMENT

Newly-hatched great blue herons in two Nova Scotia colonies had mean weights of 49.3 g (SD = 3.2, n = 5) and 51.8 g (SD = 7.1, n = 39) (Quinney and Smith 1979, as cited in Butler 1992). Quinney (1982, as cited in Butler 1992) reported that the first chicks to hatch in a clutch grow faster than the last to hatch. Mass increase is nearly linear for first 30 days, and by day 45 chicks can weigh about 86% of the adult weight. Growth over the entire nestling period is best explained by logistic growth curve. Brood reduction is common in the nests, caused by aggression and competition for food among nestlings. The age of the fledglings' first flights ranges from about 50 to 60 days. Fledglings leave the nest between 60 and 91 days after hatching, depending on the hatching order and the date nesting began (i.e., chicks from late nesters leave in a shorter number of days) (Butler 1992, DeGraaf and Yamasaki 2001).

FOOD HABITS AND DIET

The diet of the great blue heron consists primarily of fish, but also amphibians, reptiles, insects, crustaceans, and sometimes small mammals and birds. They hunt by wading through or waiting in shallow water. They also hunt rodents in upland fields, especially in winter. Great blue herons hunt

night and day, and are reported to have good night vision. Prey is located by sight, caught by a rapid forward thrust of the neck, and held in the bill before ingestion. Prey is usually swallowed whole. Some fish are taken ashore, speared with the bill and shaken before being swallowed. Information on fish prey size is limited, though a range of 5 – 30 cm and occasionally larger has been reported. Some herons choke to death on large food items (Butler 1992, DeGraaf and Yamasaki 2001).

Butler (1991, as cited in Butler 1992) listed estimated mean (± SE) intake of metabolized energy per day by individual herons feeding on small fish: egg laying stage = 1,163 kJ (± 555); incubation = 1,197 kJ (± 194); small chicks = 4,264 kJ (± 764); and large chicks = 1,598 kJ (± 151).

POPULATIONS AND DEMOGRAPHY

Survivorship and Mortality: Survivorship varies regionally. Estimates from band recovery data indicate mortality is about 69% the first year, 36% the second year, and 22% in subsequent years. Documented factors contributing to great blue heron mortality include disease, predation (mostly of the young), winter kill, illegal shooting, choking, and possibly high levels of chemical contamination. The young are vulnerable to predation, disease, inclement weather, starvation, and falls from the nest (both accidental and sibling-caused). The effects of egg shell thinning caused by pesticides and other chemicals has been a suspected cause of reproductive failure, though there is no clear evidence of its adverse effects (Butler 1992).

Age at Maturity and Life Span: The age at first breeding is apparently 22 months (i.e., the second spring). The oldest banded great blue heron was 23 years old, though the average life span is not well known (Butler 1992). One account indicates they live as long as 17 years in the wild (Canadian Wildlife Service 1990).

Enemies: Adult great blue herons have few natural enemies. They are occasionally preyed upon or attacked by hawks and owls, but predation is not a limiting factor on their populations (Canadian Wildlife Service 1990). The eggs and young can be heavily preyed upon in the nest by crows, ravens, hawks, owls, gulls, and raccoons. Great blue herons are known to carry the parasitic nemetode *Eustrongylides ignotus*, which can kill herons. *Giardia* has been documented in a great blue heron from New York. (Butler 1992)

STATUS

General: The great blue heron is considered to be a relatively common and increasing breeder in New England (Laughlin and Kibbe 1985, DeGraaf and Yamasaki 2001). Suitable nesting sites and an abundant food supply (related to the area of suitable, nearby wetlands) may be limiting factors in the local or regional population size.

Historically, populations have been adversely affected by shooting and egg collecting, as well as the extensive loss of wetland habitat in the U.S. within the last century (Bent 1926, Laughlin and Kibbe 1985, Butler 1992, DeGraaf and Yamasaki 2001). Changing attitudes and the regulation of wetland losses of recent years has allowed great blue heron populations to recover and stabilize throughout much of its range, though the potential for human-caused declines still exists. The great blue heron is currently not a listed species in Massachusetts or other New England States.

Great blue herons are particularly susceptible to disturbance while nesting. Though response varies among sites and relative to the stage of nesting, nest site and colony abandonment can occur as a result of human activities (e.g., logging, development) within 0.5 km. Some colonies or members of a colony can be easily disturbed early in the nesting season, and may even move or abandon the nest when people approach on foot to within a few hundred meters (Butler 1992).

In The Primary Study Area: Great blue herons were commonly seen during the 1998 – 2000 field surveys in the primary study area, stalking prey along the river edge or in backwater areas (Figure 2). As of 2000, there was an active rookery in a large freshwater marsh located approximately 1.5 miles west of the primary study area, adjacent to

the Pittsfield Municipal Airport. There were at least 10 – 12 active nests in snags over open water. It is not known if the herons seen in the study area are residents of this breeding colony.

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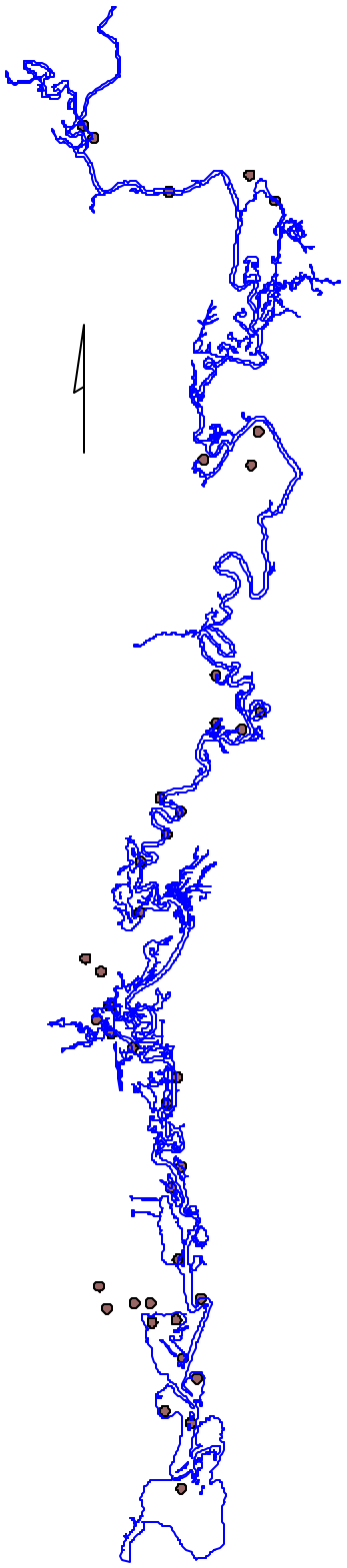

Figure 2. Great blue heron sightings in the primary study area, from 1998 – 2000 field studies