



Status: The species is not on T & E list, however, MNFI does record and monitor locations of rookeries throughout the state.

Global and State Rank: -

Family: Aredidae (herons, egrets, and bitterns)

Total Range: The great blue heron can be found throughout much of North America and into Central and South America as well.

State Distribution: In Michigan great blue heron is classified as a common permanent resident. It occurs scattered throughout most of Michigan but is much more likely to be encountered in the southern half of the state or in the Upper Peninsula. The great blue heron is vulnerable because of their colonial nesting behavior and the availability of suitable nesting habitat is declining. Construction of vacation homes, boating, sport fishing, camping, or hunting either within or in very close proximity to active heronries may be impacting the birds (Scharf 1991). These activities in many cases lead to abandonment of breeding colonies or reduced reproductive success. During the first Breeding Bird Atlas Project (1983-1988) 196 blocks contained confirmed breeding records and 960 blocks reported either probable or possible breeding records (Brewer et al. 1991). Southern Lower Michigan counties had the greatest concentration of occurrences. There were 35 active Great Lakes coastal heronries recorded in 1987 representing a 62% increase compared to 10 years

previously (Scharf 1989). The figure above indicates counties with confirmed breeding during Michigan Breeding Bird Atlas surveys, other recent breeding confirmations, or known occurrences from the Michigan Natural Features Inventory database.

Nest Recognition: The great blue heron is mostly a colonial nester, occasionally they nest in single pairs. Colonies are typically found in lowland swamps, islands, upland hardwoods and forests adjacent to lakes, ponds and rivers. Nests are usually in trees and may be as high as 98 ft. (30 m) or more from the ground. The platform like nests are constructed out of medium-sized sticks and materials may be added throughout the nesting cycle. Nests are usually lined with finer twigs, leaves, grass, pine needles, moss, reeds, or dry grass (Cottrille and Cottrille 1958, Palmer 1962, Mock 1976, and Baicich and Harrison 1997). The same nests are refurbished and used year after year. Nest size varies; newer nests may be 1.5 ft. (0.5 m) in diameter with older nests reaching up to 4 ft (1.2 m) in diameter (Andrle 1988). Nests can also be used by Canada geese (*Branta canadensis*), house sparrows (*Passer domesticus*), and great-horned owls (*Bubo virginianus*) (Vermeer 1969, Butler 1992).

Species Recognition: The great blue heron as described by Butler (1992) is the largest North American heron standing 2 ft. (60 cm.) tall and 3 - 4.5 ft. (97-137 cm) long, weighing up to 5.5 pounds (2.5 kg). It has a 6 ft. (1.8m) wingspan and while **in flight tucks its neck in a characteristic S-shape**, with its long legs trailing



along the body axis. It has a slow deep wing beat and frequently calls a deep croaking *fraaahnk*. Distinctive field marks include a **large, grayish body and white face and crown with wide black bands terminating in usually two plumes**, and yellowish bill, long and tapered. Juveniles are brownish, with gray crowns and no body plumes.

Best Survey Time/Phenology: The great blue herons in Michigan are largely migratory, with almost all leaving the state during the winter months. Most leave by end of October and return in early to mid-March. No data exists where Michigan birds over-winter but large numbers of great blue herons are recorded each year during Christmas bird surveys in the Gulf Coast States. In Michigan nest building and courtship begins in early April in the south and not until mid-May at heronries off Isle Royale (Scharf 1991). In one Michigan study to determine the number of active coastal heronries, float plane surveys were initiated during mid-April and commenced around mid-July (Scharf 1989). The first survey corresponded to the peak of egg-laying to incubation, which occurs usually before leaf-on, with the second visit occurring during late chick or the pre-fledging period.

Habitat: In Michigan, and elsewhere in eastern North America, great blue herons are found in a variety of wetland habitat types. Herons usually feed in calm, slow waters including lakes, rivers, ponds, marshes and swamps. They are occasionally seen foraging in fields and wet meadows. In Michigan nesting usually occurs in trees, although in other parts of their range they may be found nesting in low shrubs, man-made structures, artificial nest structures and even on the ground (Butler 1992, Scharf 1991). The ideal nesting habitat occurs in wooded swamps or on islands dominated by mature hardwoods; isolated locations that discourage predation by such things as snakes and mammals (Butler 1992). A wide variety of tree species have been utilized for nest placement in Michigan, including ash (*Fraxinus* spp.), aspen (*Populus* spp.), birch (*Betula* spp.), elms (*Ulmus* spp.), hickory (*Carya* spp.), various oaks (*Quercus* spp.), maples (*Acer* spp.) and white cedar (*Thuja occidentalis*). Deciduous hardwood trees are utilized more frequently in southern Michigan with softwood deciduous trees (such as aspen and birch) more commonly used in the northern part of the state (Scharf 1991). Wetland foraging areas in close proximity to nests are an important habitat component.

Biology: Most great blue herons return to southern Michigan heronries in mid-March (Scharf 1991) although a few may remain through the winter if there are areas of open water. Courtship and nest building commences from early April in southern Michigan to early May in the extreme northern portions of the state

(Isle Royale) (Cottrille and Cottrille 1958, Scharf 1989). Both sexes are involved in the nest building process with males primarily gathering sticks from the ground, nearby trees, or unguarded nearby nests. Males pass sticks to females who then place them on the nests (Cottrille and Cottrille 1958, Palmer 1962, Mock 1976). Between 3 and 7 (usually 4) greenish blue eggs are laid in April and May in Michigan. Both sexes take a turn at incubation with females incubating mostly at night and males during the day (Butler 1992). The incubation period lasts from 25-29 days (Baichich and Harrison 1997). In Michigan hatching occurs in the first week of May in the south while parents are still incubating nests in the far northern part of the state (Scharf 1989). For the first 3-4 weeks post hatching, one parent remains on the nest with the young (Baichich and Harrison 1997). The young are semi-altricial and downy, and for the first month eat regurgitated food dropped by parents into the nest (Mock 1987). Adults feed the older chicks by standing on the edge of the nest and place food items directly into the open bill of chicks (Cottrille and Cottrille 1958). Young great blue herons first fly around 60 days and leave the nest between 64-90 days (Baichich and Harrison 1997). Fall migration begins in September and October with a few birds lingering much later (Barrows 1912). Main food items include fish, crayfish, and frogs but many other animals are taken including snakes, salamanders, insects, small mammals, and birds (Barrows 1912, Butler 1992). Great blue herons hunt individually or with other great blue herons or other ciconiiforms (Kushlan 1978). They hunt mostly by standing in wait of prey in shallow water, or by slowing wading in search of food (Kushlan 1976, 1978, Hom 1983). They will occasionally hunt from floating objects (Godin 1977). Prey are located visually and caught by rapid forward thrust of head and neck, and then held between the mandibles (Butler 1992).

Conservation/Management: The first step towards heron conservation is continued monitoring of population size (Scharf 1991). Used and abandoned colony sites should be surveyed regularly, mapped by local and state agencies, and reproductive success should be monitored (Quinn and Milner 2004). Quinn and Milner (2004) suggest that the most effect way to conserve great blue herons is through comprehensive land-use planning that considers the needs of all species. Colony site-specific management plans would be the best alternative in lieu of comprehensive land use planning (Quinn and Milner 2004). If sites have to be prioritized, larger colonies should receive priority over small colonies, since there is some evidence suggesting the former have more stability and higher productivity (number of fledglings/nesting herons) (Butler 1995). Disturbances to the nesting colony (i.e., human visits, road building, logging activity) can cause abandonment



especially in the early season before eggs are laid (Vos et al. 1985). Habitat manipulation directly impacts the species by alteration of suitable structure around the heronry. Outright removal of woodlots for highway construction, home building, and other developments (such as shopping malls and golf courses) have eliminated suitable nesting habitat. To protect nesting colonies from human disturbance, most studies reviewed by Butler (1992) recommend a buffer of 300 m in which no activity occurs during the season of 15 February to 31 July. Many of the authors of these studies made recommendations in the absence of data (Quinn and Milner 2004). However, work in Canada (Vos et al. 1985) recommended a 300 meter no activity buffer to minimize disturbances to nesting great blue herons (Quinn and Milner 2004). This distance is based on their experimental work, with 200 meters being their greatest flushing distance plus an additional 50 meters as a safeguard. Hoover and Willis (1987) recommend that important foraging areas within 4 km (2.5 mi.) be protected from development if possible. Quinn and Milner (2004) suggest that these colony buffer zones (300 m) and foraging areas (within 4 km of colonies) should also be free of pesticides. Historically shooting adults at nests was extremely damaging to populations and while now considered less of a threat, some limited amount still occurs (Scharf 1989).

Research Needs: There are many research needs concerning this species, a few of which are listed below. In the last decade very limited systematic inventory has been completed throughout the state. Regular aerial searches of nesting areas in Michigan are needed to acquire accurate locations of heronries, to make nest counts, and to better understand the status and trends of the population. Information is lacking on the productivity and reproductive success of the great blue heron in Michigan and the differences between coastal and interior populations. Also, little research has been conducted on the impacts of urbanization and suburbanization on habitat use and nest productivity. More quantitative research is needed to assess the impacts of human disturbance on great blue heron abundance and productivity. Additional research needs include the impacts of predation, contaminants, and competitors on nesting success, and landscape-level analysis of habitat. Most productivity studies have documented only the number of fledged young per successful nest and show little annual variation (Butler 1992). Butler (1992) suggests that future productivity studies should determine number of fledglings raised per nesting attempt. Little information is available on the timing and routes of migration throughout the state as well as the U.S. (Butler 1992). While some regional datasets exist on arrival and departure dates, Butler (1992) suggests more data is needed to establish a better migration chronology.

Related Abstracts: Wooded Dune and Swale Complex, Great Lakes Marsh, Mesic Northern Forest, Mesic Southern Forest, black-crowned night-heron.

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