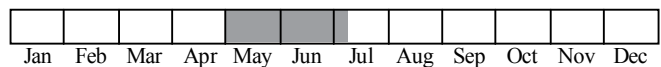


Best Survey Period



Status: State special concern

Global and state rank: G5/S2S3

Family: Ardeidae – Herons, Egrets, and Bitterns

Total range: Black-crowned night-herons breed on every continent except Australia and Antarctica (Davis 1993). In North America the species breeds throughout most of the United States extending north into southern Alberta, Saskatchewan, and Manitoba and south into coastal Mexico. Black-crowned night-herons are year-round residents in many coastal areas, the lower Mississippi and Ohio River valleys, and parts of the lower Great Lakes (Davis 1993). Wintering black-crowned night-herons can be found in southwestern Texas and throughout much of Mexico and Central America (Davis 1993).

State distribution: Barrows (1912) noted that the black-crowned night-heron did not appear to be common anywhere in Michigan, while Wood (1951) called the species a summer resident and common locally in southeastern Lower Michigan. Payne (1983) listed the black-crowned night-heron as an uncommon transient and summer resident and noted that the breeding population was 310 pairs at eight sites from Saginaw Bay to Big Bay de Noc. Most nesting in

Michigan now occurs along the shores of Lakes Huron and Erie (Scharf 1991). According to Scharf and Shugart (1985), nesting habitat in Michigan extends from the Erie marshes near the Ohio border northward to Saginaw Bay, Thunder Bay, Big Bay de Noc, and its furthest northward limit near the Straits of Mackinac. Multiple observations of flightless juveniles in Oakland County indicated successful breeding in 1997 (Appelbaum 1998). Black-crowned Night-Herons have also been flushed from nesting colonies of other species in northern Michigan, including Bellows Island in Grand Traverse Bay and Gem and Rock Islands in Lake George of the St. Mary’s River system, but evidence of nesting was not found (Scharf 1991). Scharf (1991) stated that the current distribution in Michigan shows a marked preference for islands. The figure above reflects counties with confirmed breeding during Michigan Breeding Bird Atlas surveys, other recent breeding confirmations, or known occurrences from the Michigan Natural Features Inventory database.

Recognition: The black-crowned night-heron is a **medium-sized heron**, measuring 23 – 26 in (58 – 66 cm), with a **stocky build**, relatively **short neck and legs**, and **sexually monomorphic plumage** (Davis 1993). Gross (1923) found that males (1.7 – 2.2 lbs, 785 – 1014g) are slightly heavier than females (1.6 – 2.0 lbs, 727 – 884 g), although their weights overlap.



Adults are easily identified by their **black cap, upper back, and scapulars**, gray wings, rump, and tail, and **white to pale gray underparts** (Davis 1993). The **bill is stout and black, eyes are red**, and legs are yellow-green for most of the year, but pink during the height of the breeding season (Davis 1993). Davis (1993) described juveniles and first winter birds as brown above with large pale spots on the back, scapulars, and coverts, with underparts paler and heavily striped with brown, while older immatures up to about 2 years old are still mostly brown but more solidly dark above and light below, gradually approaching the adult pattern. Immature birds are sometimes confused with American bittern (*Botaurus lentiginosus*); however, that species has a long dark mark on the side of the neck and lacks large pale spots on the underparts (Davis 1993). Juvenile yellow-crowned night-heron are more similar; however, Davis (1993) noted that they have smaller pale spots above, longer legs, and a heavier, all-black bill. Payne (1983) considered the Yellow-crowned Night-Heron an occasional summer resident in Michigan, and Carpenter (1991) indicated that the species is probably a rare breeder across the southern Lower Peninsula. The best known black-crowned night-heron vocalization is its **“Quawk” call**, most often given at night while in flight or from a perch (Scharf 1991, Davis 1993). Hancock and Kushlan (1984) described its advertising call as a hissing **“Plup”**, threat call as **“Rok-rok”**, disturbance call as **“Wok-wok”**, and landing call as **“Kak-kak”**.

Best survey time: Although black-crowned night-herons are known to occasionally winter in Michigan, the best time to survey for this species is during the breeding season. Surveys for breeding colonial waterbirds are typically conducted when birds are actively nesting. Since black-crowned night-herons feed primarily at night, the species is most likely to be at or near the nest site during daytime hours; however, the demands of young can sometimes keep black-crowned night-herons foraging during daylight hours (Davis 1993). Black-crowned night-herons typically arrive in southeastern Michigan in April (Wood 1951); however, Scharf (1991) notes that nesting can span from early May into July. A number of techniques have been used to survey nesting colonial waterbirds, including ground surveys on foot or by boat and aerial surveys using fixed-wing aircraft or helicopters (Steinkamp et al. 2003).

Habitat: The habitats used by the black-crowned night-heron throughout its breeding range are extremely varied and include swamps, streams, rivers, margins of pools, ponds, lakes, lagoons, tidal mudflats, salt marsh, man-made ditches, canals, ponds, reservoirs, and wet agricultural fields (Davis 1993). During their study of Iowa prairie marshes, Brown and Dinsmore (1986) listed the species as possibly area-dependent. The distribution of black-crowned night-herons appeared to be dependent upon marsh size, with the only observations occurring on wetlands larger than 50 acres (20 ha); however, this relationship was not statistically significant (Brown and Dinsmore 1986). Davis (1993) states that migrating birds concentrate in wetlands associated with coasts and the Mississippi River drainage, while wetlands used for wintering are as varied as those used for breeding (Hancock and Kushlan 1984). Black-crowned night-herons breeding in Michigan primarily use habitats associated with the shores of Lakes Huron and Erie and prefer to nest in shrubs and small trees from 6 to 18 feet in height (2 to 6 m) (Scharf 1991). Davis (1993) noted that most nesting colonies are located on islands, in swamps, or over water, suggesting that site selection may be related to predator avoidance. Shallow, weedy pond margins, creeks, and marshes are preferred foraging habitats (Davis 1993).

Biology: Wood (1951) noted that the arrival of black-crowned night-herons at Erie marsh in extreme southeastern Lower Michigan occurred between April 7 and 21. The species is presumed to be monogamous, and pair formation and nest initiation are essentially contiguous events, especially when old nests are used (Davis 1986, 1993). Breeding usually occurs at 2 yrs of age (Davis 1993); however, Custer and Davis (1982) reported a successful pair of 1 yr old birds and a 1 yr old paired with a 2 yr old. Males choose nest sites and advertise for females and begin nest building or refurbishing of old nests; later the male brings material to the female, which she uses to continue nest building (Davis 1993, Baicich and Harrison 1997). Davis (1986) observed 86% of the birds at a Massachusetts colony study plot reusing old nests. The nest site can occur from the ground level up to 150 feet above ground and generally consists of a platform with a shallow hollow made of twigs, reeds, and similar material (Baicich and Harrison 1997). Nest material is highly variable and dependent upon the vegetation immediately available,



and nests can occur in trees, shrubs, and emergent vegetation. Hoffman and Prince (1975) found 93% of the nests of one Michigan colony in box elders (*Acer negundo*). Nests can be near tree trunks or distal forks of branches and in the open or deep in foliage (Davis 1993). In Michigan eggs can be found in early May, but the egg-laying season may extend into July, with colonies showing great asynchrony in nesting (Scharf et al. 1978). Scharf (1991) indicated that such a long breeding season is an adaptation that allows the black-crowned night-heron to exploit habitats over much of its range. Females lay eggs at two-day intervals and both parents incubate beginning with the first egg; hatching occurs in 23 – 26 days for North American birds (Hancock and Kushlan 1984, Custer et al. 1992). This heron has only one brood per season, but will renest if the first nest fails (Nickell 1966). Clutch size is 3 – 4 and sometimes 5 and the eggs are pale greenish-blue, sometimes more green or wholly blue, smooth and non-glossy, and elliptical to subelliptical (Baicich and Harrison 1997). Baicich and Harrison (1997) described the nestlings as semi-altricial and downy, rufous-brown above with pale tips forming a crest on the head, and white on the thighs. Young are tended by both parents and are brooded nearly constantly for the first 10 days after hatching (Davis 1993, Baicich and Harrison 1997). The parents deliver regurgitated food directly to young chicks, but later dump into the nest when chicks are older (Davis 1993). Davis (1993) states that young can leave the nest after two weeks, by three weeks can often be found at the top of trees when disturbed, and by six to seven weeks can fly and depart for feeding grounds. Although most individuals in the northern part of the range migrate south (Davis 1993), Payne (1983) listed the black-crowned night-heron as an occasional species during winter in Michigan. Wood (1951) stated that southward migration in Michigan occurs in September and October. Black-crowned night-herons feed primarily from evening to early morning, but will also forage during the day during periods of high food demand, such as when brooding prefledged young (Bent 1926). This heron is opportunistic and feeds on a wide variety of foods across its range, including leeches, earthworms, aquatic and terrestrial insects, prawns and crayfish, mussels, squid, freshwater and marine fish, amphibians, lizards, snakes, rodents, birds, eggs, carrion, plant material, and garbage from landfills (Kushlan 1978). Scharf (1991) noted that fish and amphibians are

important food sources in Michigan, as well as gull and tern chicks from colonies that are often in proximity to black-crowned night-heron nesting sites. Generally this species is a solitary forager that will defend a feeding territory and is known to use eight feeding behaviors: standing, bill vibrating, standing fly-catching, walking slowly, hovering, plunging, feetfirst diving, and swimming feeding (Kushlan 1978, Davis 1993). Riehl (2001) documented black-crowned night-herons manipulating bread in water to catch fish attracted to the bait.

Conservation/Management: Scharf (1991) stated that black-crowned night-herons are present in large numbers in parts of their range, but when comparisons are made to historical nesting abundance, declines are noted nearly everywhere. Habitat destruction continues to be a problem for this species, with habitat alteration and food availability being the major factors regulating population numbers (Davis 1993). However, Davis (1993) indicated that because early census data is lacking, population trends are difficult to assess and most populations appear to be stabilized or increasing. The black-crowned night-heron is a species of special concern in Michigan and Wisconsin, listed as threatened in Ohio, and designated as endangered in Indiana and Illinois. Because this species is high on the food chain, it is vulnerable to pesticides and other contaminants (Davis 1993). Declines in black-crowned night-heron populations during the 1950's and 1960's were probably related to eggshell thinning caused by DDT application (Davis 1993, Anderson and Hickey 1972). Hoffman et al. (1986) linked PCB contamination to decreased growth of black-crowned night-heron embryos. Some studies conducted after the 1972 DDT ban have indicated that the impact of DDE and PCB contamination on reproductive success of black-crowned night-herons has lessened (Custer et al. 1983, Blus et al. 1997). Researchers have also implicated organochlorines and heavy metals in the death or impairment of some birds (Ohlendorf et al. 1979, Custer and Mulhern 1983). As of the mid-1980's, there were still contamination problems in southern and western U.S. birds, with the likely source of western bird contamination being Mexican wintering grounds (Fleming et al. 1984, Henny and Blus 1986).

Man-made islands, most of which are created by the U.S. Army Corps of Engineers (USACE), are widely



used by nesting wading birds (Davis 1993). Scharf (1991) stated that the development of confined disposal facilities at Pointe Mouillee and Saginaw Bay by the USACE has not only created nesting sites for black-crowned night-herons and other waterbirds, but provided a significant food source in the form of aquatic organisms and gull and tern chicks. Calls for the control of ring-billed gulls in these areas could impact an important food source (Scharf 1991). Scharf (1991) also cautioned that the policy of the USACE to turn over ownership of artificial islands to other organizations, which may convert these areas to uses incompatible with nesting birds, could lower the suitability of these habitats. The reliance of Michigan's birds on shrubs and small trees for nesting means that vegetative succession could cause existing heronries to become unsuitable unless new habitat develops. The vegetation at some colony sites is constantly renewed by ice and wind action, and vegetation at other sites could be controlled through appropriate management (Scharf 1991). Periodic selective cutting of mature trees near existing colonies could ensure the presence of the mid-successional habitat preferred by nesting black-crowned night-herons. Tremblay and Ellison (1979) found that frequent disturbance of nests by researchers just before or during egg laying caused some nest abandonment and predation, so disturbance of known nesting colonies should be avoided during this period. Scharf (1991) stated that the survival of Michigan's black-crowned night-herons depends on conserving natural diversity in coastal marshes and keeping both the mainland and island nesting sites free of human disturbance. Although nesting and foraging habitats in Michigan are at least partially protected through public ownership and wetland protection statutes, the rapid expansion of coastal development and recreation requires continued monitoring to assess threats to black-crowned night-herons (Scharf 1991).

Research needs: While the black-crowned night-heron is presumed to be monogamous, Davis (1993) noted that information from studies of marked birds is needed to better understand the species' mating system and the duration and maintenance of the pair bond. Continued monitoring of Michigan's nesting colonies is crucial to the conservation of this species. Detailed information regarding the location, size, productivity, and expected long-term viability of nesting colonies is needed. Because the black-crowned night-heron is a

predator that forages in aquatic systems, periodic monitoring of contamination levels in these and other waterbirds would be prudent. The recovery of double-crested cormorants (*Phalacrocorax auritus*) in the Great Lakes region has prompted concern about possible impacts to other colonial waterbirds, which Cuthbert et al. (2002) believe could be caused through competition for limited habitat or the destruction of vegetation used for nesting. While preliminary investigations have not indicated a decline of black-crowned night-heron at the regional level due to the presence of double-crested cormorants, cormorants have caused total or partial loss of forest cover at some sites and initial soil chemistry suggests that normal plant growth and survival will be affected (Cuthbert et al. 2002). Clearly, further work is needed to understand how black-crowned night-herons and other waterbirds interact with this now ubiquitous species at nesting sites.

Related abstracts: Great Lakes marsh, American bittern, great blue heron rookery.

Selected references:

- Anderson, D.W., and J.J. Hickey. 1972. Eggshell changes in certain North American birds. *Proceedings of the International Ornithological Congress* 15:514-540.
- Appelbaum, D. 1998. Oakland County nesting of black-crowned night-heron. *Michigan Birds and Natural History* 5(1):12.
- Baicich, P.J., and C.J.O. Harrison. 1997. A guide to the nests, eggs, and nestlings of North American birds. Second Edition. *Natural World*, Academic Press, San Diego, CA.
- Barrows, W.B. 1912. Michigan bird life. Michigan Agricultural Experiment Station Bulletin No. 94. East Lansing, MI.
- Bent, A.C. 1926. Life histories of North American marsh birds. Smithsonian Institution, U.S. National Museum Bulletin No. 135. Washington, DC.
- Blus, L.J., B.A. Rattner, M.J. Melancon, and C.J. Henny. 1997. Reproduction of black-crowned night-



- herons related to predation and contaminants in Oregon and Washington, USA. *Colonial Waterbirds* 20(2):185-197.
- Brown, M. and J.J. Dinsmore. 1986. Implications of marsh size and isolation for marsh bird management. *Journal of Wildlife Management* 50:392-397.
- Carpenter, T.W. 1991. Species account for yellow-crowned night-heron. Pages 533-534 *In* The Atlas of Breeding Birds in Michigan. Brewer, R., G. A. McPeck, and R.J. Adams, Jr. (eds). Michigan State University Press, East Lansing, MI.
- Custer, T.W., and W.E. Davis, Jr. 1982. Nesting by one-year-old black-crowned night-herons on Hope Island, Rhode Island. *Auk* 99:784-786.
- _____, G.L. Hensler, and T.E. Kaiser. 1983. Clutch size, reproductive success, and organochlorine contaminants in Atlantic Coast black-crowned night-herons. *Auk* 100:699-710.
- _____, and B.L. Mulhern. 1983. Heavy metal residues in prefledging black-crowned night-herons from three Atlantic Coast colonies. *Bulletin of Environmental Contamination and Toxicology* 30:178-185.
- _____, G.W. Pendelton, and R.W. Roach. 1992. Determination of hatching date for eggs of black-crowned night-herons, snowy egrets, and great egrets. *Journal of Field Ornithology* 63:145-154.
- Cuthbert, F.J., L.R. Wires, and J.E. McKearnan. 2002. Potential impacts of nesting double-crested cormorants on great blue heron and black-crowned night-herons in the U.S. Great Lakes region. *Journal of Great Lakes Research* 28(2):145-154.
- Davis, W.E., Jr. 1986. Effects of old nests on nest-site selection in black-crowned night-herons and snowy egrets. *Wilson Bulletin* 98:300-303.
- _____. 1993. Black-crowned night-heron (*Nycticorax nycticorax*). *In* The Birds of North America, No. 74 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.
- Fleming, W.J., B.P. Pullin, and D.M. Swineford. 1984. Population trends and environmental contaminants in herons in the Tennessee Valley, 1980-81. *Colonial Waterbirds* 7:63-73.
- Gross, A.O. 1923. The black-crowned night-heron (*Nycticorax nycticorax naevius*) of Sandy Neck. *Auk* 40:1-30, 191-214.
- Hancock, J., and J. Kushlan. 1984. The herons handbook. Harper and Row, New York, NY.
- Henny, C.J., and L.J. Blus. 1986. Radiotelemetry locates wintering grounds of DDE-contaminated black-crowned night-herons. *Wildlife Society Bulletin* 14:236-241.
- Hoffman, D.J., B.A. Rattner, C.M. Bunck, H.M. Ohlendorf, and R.W. Lowe. 1986. Association between PCBs and lower embryonic weight in black-crowned night-heron in San Francisco Bay. *Journal of Toxicology and Environmental Health* 19:383-391.
- Hoffman, R.D. and H.H. Prince. 1975. Vegetative structure and nest distribution in a black-crowned night-heron heronry. *The Jack-Pine Warbler* 53(3):95-99.
- Kushlan, J.A. 1978. Feeding ecology of wading birds. Pages 249-297 *In* Wading Birds (Sprunt et al., eds.). National Audubon Society Research Report No. 7, New York, NY.
- Nickell, W.P. 1966. The nesting of the black-crowned night-heron and its associates. *Jack-Pine Warbler* 44:130-139.
- Ohlendorf, H.M., D.M. Swineford, and L.N. Locke. 1979. Organochlorine poisoning of herons. *Proceedings of the Colonial Waterbird Group* 3:176-185.
- Payne, R.B. 1983. A distributional checklist of the birds of Michigan. University of Michigan, Museum of



Zoology Miscellaneous Publication No. 164, Ann Arbor, MI.

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Riehl, C. 2001. Black-crowned night-heron fishes with bait. *Waterbirds* 24(2):285-286.

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Scharf, W.C. 1991. Species account for black-crowned night-heron. Pages 116-117 *In* The Atlas of Breeding Birds in Michigan. Brewer, R., G. A. McPeck, and R.J. Adams, Jr. (eds). Michigan State University Press, East Lansing, MI.

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_____, and G.W. Shugart. 1985. Population sizes and status recommendation for double-crested cormorants, black-crowned night-herons, caspian terns, common terns, and Forster's terns in the Michigan Great Lakes in 1985. Report to the Michigan Department of Natural Resources.

_____, G.W. Shugart, and M.L. Chamberlain. 1978. Colonial waterbirds nesting on man-made and natural sites in the U.S. Great Lakes. U.S. Army Corps of Engineers, Waterways Experimental Station Technical Report D-78-10.

Steinkamp, M., B. Peterjohn, V. Byrd, H. Carter, and R. Lowe. 2003. Draft breeding season survey techniques for seabirds and colonial waterbirds throughout North America. Online report <http://www.waterbirdconservation.org/pubs/PSGManual03.PDF>.

Tremblay, J. and L.N. Ellison. 1979. Effects of human disturbance on breeding of black-crowned night-herons. *Auk* 96:364-369.

Wood, N.A. 1951. The birds of Michigan. University of Michigan, Museum of Zoology Miscellaneous Publication No. 75.

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