

ABOUT THE COVER

Double-crested Cormorant

The Double-crested Cormorant (*Phalacrocorax auritus*) is North America's most widespread and abundant cormorant species. Its generic name comes from the Greek *Phalakrokax* that means "bald raven," and its species name means "eared," the latter describing the plumes that are present during March through May in both sexes. The word cormorant comes from Old French *cormoran* that is derived from *corp* (meaning "crow") and *marenc* ("belonging to the sea"). The Double-crested Cormorant appears largely black, but at close range and in good light some feathers show a greenish or bronzy cast. It is distinguished from other cormorant species by the orange-yellow facial and throat skin. Great Cormorants are larger, have white hip patches during breeding season, and have white feathers on the throat. The sexes are similar in plumage. Juvenile Double-crested Cormorants have light-colored breasts and dark stomachs, while juvenile Great Cormorants have the reverse pattern. Double-crested Cormorants are frequently seen perched on rocks or man-made structures, often with wings spread. Cormorants have wettable feathers, thought to be an adaptation for diving, and the spread-wing posture is an adaptation for drying out wet feathers.

The Double-crested Cormorant is polytypic, with five generally accepted subspecies based on differences in size and plume characters. The nominate race *P. a. auritus* is found in eastern and central North America. Double-crested Cormorants follow Bergmann's Rule (in widely distributed species, individuals from higher latitudes will tend to be larger), with the largest individuals from Alaska and the smallest from Florida and the Caribbean. Larger individuals retain body heat more easily than smaller ones because of their proportionally larger volume compared to surface area. The Double-crested Cormorant is most closely related to the Neotropic Cormorant. The breeding range of the Double-crested Cormorant is disjunct, from Alaska south through Baja on the Pacific Coast, in the northern interior of the USA and southern Canada to the Great Lakes, on the East Coast from Newfoundland south to New York, and in Florida and the Caribbean. Recent range expansion has produced a series of colonies between New York and Florida. In Massachusetts the Double-crested Cormorant is an abundant migrant and breeding species. In spring they migrate mostly along the coast and begin to arrive in late March; migration peaks in late April. Fall migration peaks in October with larger numbers than in the spring. A daily high of 5000 plus has been recorded at Plum Island. They are often seen flying in lines or loose Vs. In Massachusetts Double-crested Cormorants have been rare winter residents, but in recent years they have been reported in larger numbers.

Double-crested Cormorants are monogamous and usually produce a single brood. They are gregarious, colonial breeders that prefer coastal or inland islands that offer protection against predators. They are territorial only at the nest site, where fighting between males can occur, one bird grabbing the beak, wing, or neck of another and shaking it. Threats include hissing with neck stretched, mouth wide open, displaying its cobalt blue lining, a color that fades after the breeding season. A recognition or

gape display is given by both males and females with stretched neck, waving head, and open mouth. The male chooses a nest site and displays to attract a mate. In this wing-waving display the male stands, breast down, tail and closed wings cocked, bill pointing to the sky, accentuating the pattern of orange of the facial and throat skin and bright purple-blue eyes. He raises his wingtips in synchrony with head movement and *ugh-ugh* calls.

Doubled-crested Cormorants breed in either single or mixed species colonies with gulls or herons. The nest is typically on the ground or in trees, but they also use man-made structures. The nest, constructed by both male and female, is a platform of sticks with plant material and may contain a variety of human artifacts, including rope, fishing net, and plastic debris. The nest eventually becomes a rigid structure cemented together with guano. Dead chicks are simply trampled flat and become part of the nest structure. The nesting situation is not very hygienic, and colonies are known for their smell of rotting fish and guano. The clutch is usually three or four light-blue eggs, and both parents share incubation for about four weeks until hatching. The chicks are altricial, hatching naked and with their eyes closed. Both parents brood the chicks until they can regulate their own temperature, and shade chicks and give them water in hot, sunny weather. Adults and young respond to heat stress with gular flutter, where the throat (gular) skin is vibrated with the mouth open, producing air flow over moist tissues that produces evaporative cooling. Parents defend their chicks against predators, vomiting fish in the direction of the intruder. In ground nests, chicks will often wander after three or four weeks, forming crèches (nurseries) and returning to their nest to be fed, while in tree nests they may remain for six to seven weeks until they can fly. Both parents feed young, typically opening their bills wide and letting the chick feed from their open maw. The larger chicks tend to get more food and often the last hatched, smallest chick will starve if food is scarce.

Double-crested Cormorants are diurnal foragers with eyes adapted for seeing under water, and they have salt glands that allow them to drink salt water. They dive from the surface using their webbed feet to propel them through the water. They prefer shallow water and are sometimes used as beaters by herons and pelicans. They eat mostly fish but also take crustaceans and the occasional amphibian. The nail at the end of their bill serves as a hook for grasping prey. They can swallow sizable fish, sometimes hammering them and then tossing them into the air to position them head first in their bill. Swallowing large prey is made possible by widely opening jaws, facilitated by a hinge arrangement with the upper bill and skull. Indigestible prey parts are ejected as pellets. Cormorants may forage in flocks, sometimes coordinating their efforts in lines or crescents to drive fish into shallow water.

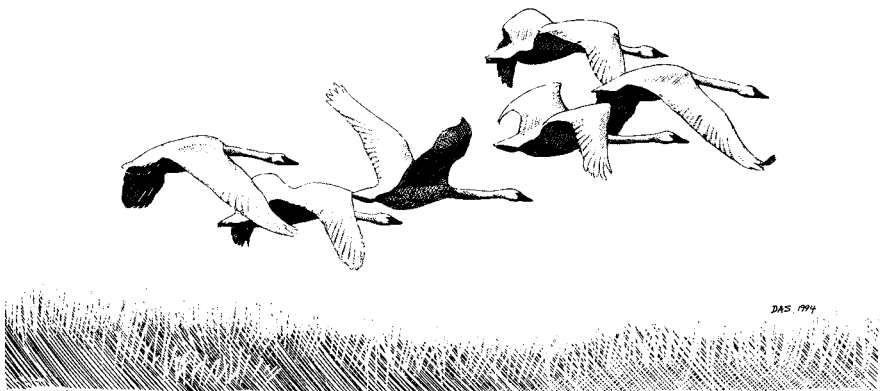
Double-crested Cormorants lose eggs and chicks to mammalian predators such as raccoons and foxes, and to gulls and raptors. But the greatest impact historically on cormorant populations has been persecution by man. Numbers were reduced drastically by early in the 19th century, and the species had been largely extirpated from Massachusetts, due to shooting and habitat alteration. Commercial and sport fishermen have traditionally considered cormorants competitors and treated them accordingly. Populations began to recover early in the 20th century, but cormorants

were hard hit by DDT and its derivatives, with subsequent reduction of numbers. Contaminants in the Great Lakes were responsible for a host of embryonic abnormalities and development of individuals with gross bill deformities. Since the 1970s, when these problems were ameliorated, they have experienced rapid population growth in many areas, including New England, and population levels have reached crisis proportions, touching off new rounds of human persecution. Not surprisingly, wintering birds tend to congregate in areas of abundant food, and the catfish farms and other aquaculture facilities, particularly in the southeast, have been inundated by cormorants. This population explosion has elicited control measures, including permits for shooting cormorants at aquaculture facilities, and programs of oiling eggs on the breeding grounds in Quebec and elsewhere. A rather extreme example of persecution was the use of flamethrowers in a nesting colony. Yet these sturdy and resilient birds continue to do well and remain abundant in their coastal and freshwater haunts. 📌

William E. Davis, Jr.

About the Cover Artist

Ikki Matsumoto is a Japanese-born artist who came to the United States in 1955 as a twenty-year-old student. At the Art Academy of Cincinnati he studied under the noted wildlife artist, Charles Harper. After graduation his initial work was in advertising as an illustrator and designer, but in 1975 he moved his family to Sanibel Island, Florida, where he established a new career as a painter and printmaker, using the native birds as his subjects. He and his wife Polly now operate a gallery and frame shop there and he continues to produce paintings and prints for exhibitions in Florida and in Tokyo. You can find more of his work and additional gallery information at <http://www.ikkimatsumoto.com>. 📌



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