

Hérons and Bitterns

mEMBERS OF THE HERON FAMILY CAN, IN the main, be described as long-billed, long-necked, long-legged, long-toed birds, well suited for wading in water searching for prey. A few have secondarily become more terrestrial or arboreal, and have the characteristic features somewhat reduced.

Hérons typically wade in water or walk along the shore or on land looking for prey, or else they may stand quietly waiting for it to become apparent. Many species also use more active techniques. The neck and bill are particularly suited for capturing mobile prey. After a rapid thrust of the head and neck, aided by a hinge formed by elongated neck vertebrae, the sharp bill is used like a pair of forceps for grabbing, or like a rapier for impaling, the victim.

Fishers on Stilts

FORM AND FUNCTION

All herons are highly specialized predators on live prey, usually fish and aquatic crustaceans, but also insects, amphibians, reptiles, mammals, and even birds. Larger herons, such as the Goliath or Great blue, catch exceptionally large fish. Smaller species concentrate on small fish and invertebrates. Some are dietary specialists, such as the Yellow-crowned night heron, which concentrates on crabs and crayfish, the Cattle egret on orthopterans (crickets and grasshoppers), and the Reddish egret on shoaling fish.

Large herons have big, strong bills for capturing large prey. Herons eating fast-moving fish have thin, elongated bills, a feature that is most marked in the Agami heron. Terrestrial herons have shorter, thicker bills and necks. The Boat-billed heron has a large, spoonlike bill. Long-necked herons curl their neck and head back in flight, creating a silhouette that is diagnostic of the family. Other herons are more compact. Wings are broad, and their beat typically slow and deep. Herons are capable of flying very long distances.

The bills, legs, irises, and facial skin of many species vary in color according to season. Non-breeding colors – typically horn, yellow, green, or brown – turn red, orange, or blue in courtship, and sometimes even within seconds during aggressive encounters. Some herons develop exceptional plumes on the head, neck, breast, or back that assume their most luxurious color, length, and texture as courtship commences. Most extravagant of all are the back plumes of egrets such as the Great, Little, and Chinese, which were the subject of market hunting in the



late 19th and early 20th century. Head plumes are found throughout the family.

Hérons spend much of the nonfeeding portion of the day at roost, where they rest and preen. Special feathers, called powder down, provide a supply of absorbent dust that is rubbed into plumage with the aid of the bill and a comblike toenail. Feather maintenance is apparently quite important to these birds, which spend much of their active day in water.

The typical herons and egrets (subfamily Ardeinae) exhibit a range of size, behavior, and coloration. They range from the huge Goliath heron to the small *Butorides* species, and from herons that feed passively by standing about to others that actively pursue prey. Some are black, others white or multi-hued, but the most usual pattern is darker above, lighter below, with a cryptic neck. The entire range of communality occurs within the Ardeinae.

Largest of the "giant" birds is the massive Goliath heron, although an even larger species, now extinct, existed in Europe within historic times. The best-known of all herons are the three "large" species: the Grey heron of the Old World, its North American equivalent the Great blue, and the South American Cocoi heron. All three have blue, gray, or blackish heads and bodies, with some white and heavily-marked white necks. The Grey and Great blue herons both have reached distant places, breeding from the far north into

the tropics; each has developed a pale coastal race, in coastal West Africa and the Caribbean respectively.

The medium-sized egrets and herons are often characterized by distinctive breeding plumes. They include the most adaptable herons, and also some of the most threatened. The Little egret, currently recognized as comprising several quite distinctive subspecies from Europe, Asia, and Africa, has recently invaded the New World via the Lesser Antilles. Conversely, the Slaty, Chinese, and Reddish egrets all have highly restricted distributions, due to narrow habitat requirements.

The night herons are now known to be typical herons. These stocky birds, with relatively short, thick bills and legs that are also short, at least in comparison with other herons, are nocturnal feeders with large eyes that are useful under diverse light conditions. Juveniles have cryptic plumage. The Black-crowned and Rufous night herons are the most cosmopolitan species, together occupying a nearly worldwide range. The best-known of the night herons is the Black-crowned, a gregarious bird often seen in cities. *Gorsachius* night herons are found in wet forests, which have suffered widespread destruction; their ranks include one of the most endangered of all species, the White-eared night-heron of China.

Bitterns are solitary birds that feed mainly in the daytime, stalking their prey with great stealth. Most have brown to yellow plumage, often very



▲ Above Frozen in the reeds, a Eurasian bittern demonstrates its brilliantly effective camouflage. When the neck is held upright its markings blend perfectly with the reeds.



◀ Left Snowy egrets (*Egretta thula*) are easily recognized not only by their pure white plumage but also by their habit of sprinting rapidly through shallow water when hunting. It is thought these two features attract other birds, which then join in the feeding.

▲ Above Upon catching its prey – here a frog – the Goliath heron (*Ardea goliath*) will take it to a safe place and stab it to death with its bill before swallowing it headfirst. After eating, the heron will drink and/or clean its bill, preen, and rest.

FACTFILE

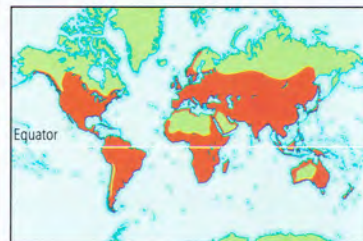
HERONS AND BITTERNS

Order: Ciconiiformes

Family: Ardeidae

62 species in 17 genera

DISTRIBUTION Worldwide except high latitudes.



HABITAT Wetlands, marshes, and shallow waters.



SIZE Length ranges from 27cm (11in) in the Least bittern to 150cm (60in) in the Goliath heron; weight from 100g (3.5oz) to 4.5kg (10lb) in the same 2 species.

DIET Fish, crustaceans, amphibians; some insects, reptiles, mammals, birds.

CONSERVATION STATUS 3 species, including the White-bellied heron, are Endangered, and 5 more are Vulnerable. The New Zealand little bittern and 3 *Nycticorax* species of night-herons are listed as Extinct.

See Heron and Bittern Subfamilies ▷



heavily streaked to camouflage them in their reed-bed habitats. The largest are very stocky, but the Least bittern is the smallest of all herons. When disturbed, they freeze with the bill pointed skyward, in a position called the “bittern posture” that is also used less frequently by many other herons.

The bittern focuses its eyes beneath its upturned bill for close observation, sometimes swaying like a reed in the wind. The larger species can handle very big fish, while all take small fish, frogs, and insects. The Eurasian bittern is famed for its booming breeding call, which can be heard at distances of up to 5km (3 miles).

Tiger herons owe their name to their striped plumage. They tend to live solitarily in dense tropical swamp forests, usually along rivers. Some occur in lowlands, others are mountain-dwellers. Few nests have been recorded, and their solitary habits and camouflage have kept much of their biology a mystery. The voice is not well described, but includes booming roars.

The Agami is an unusual heron, with an exceptionally long bill and neck. This species has only recently come to be understood, through molecular study, as being evolutionarily distinctive as

swamps, where it perches by the waterside waiting to lunge forward, using the full extent of its neck and head.

The Boat-billed heron, with its curious, slipper-shaped bill, is the most atypical of all herons. Once thought to be closely related to the Black-crowned night heron, it has now been shown by molecular study to be distinctive, the similarities probably being due to convergence because of similar nocturnal habits. It feeds in shallow water like a normal heron, but can also use its bill to scoop prey from water and mud.

Group Master Feeders

DIET

The heron family’s physical characteristics – long legs, necks, and bills – predispose them for wading in shallow water, using the full reach of their neck and bill to strike at elusive fish and aquatic invertebrates. Some species have secondarily become adapted to more terrestrial feeding on insects, and all herons will take whatever they can

➤ **Right** The distinctive Boat-billed heron is actually more strictly nocturnal than the so-called night herons. It is rarely seen during the day away from its mangrove-thicket roosts, where it creeps and awaits dusk.



catch handily. Some individuals specialize – for example, some Black-crowned night herons regularly eat small chicks of other birds in their nesting colony. Nonetheless, the fundamental adaptive suite of the family reflects their ability to catch fish and invertebrates in shallow water.

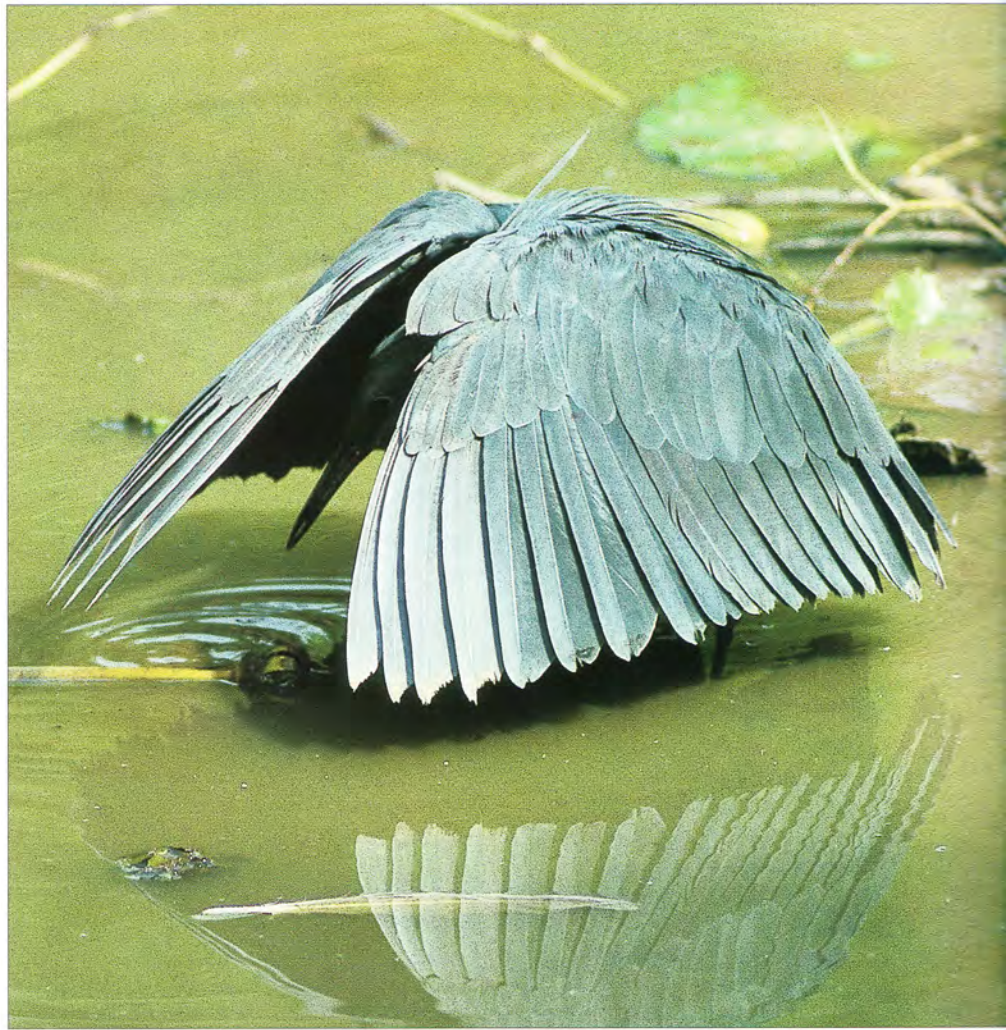
Hérons are mobile birds. Most individuals move significant distances, not only seasonally but also from day to day and even hour to hour. They choose feeding sites, often with other birds, staying for as long as is profitable and then moving on. The white plumage of many species, such as Little egrets, has been shown to attract other birds to a feeding site. These species typically form the core of mixed-species aggregations. It appears that feeding in aggregations on highly concentrated prey offers commensal advantages – the more birds (up to a limit), the more vulnerable the prey.

Hérons also feed commensally by following animals. The most specialized commensal forager is

◀ **Left** Capable of carrying twigs and small branches up to 30cm (1 foot) long, the male Great blue heron passes this nesting material on to the female, who then constructs the nest.

▶ **Right** In an act known as “mantling,” a Black heron makes a cowl with its wings while hunting. The shadow may deceive fishes into believing they are fleeing into cover, or enable the heron to see them better.

◀ **Below** As well as gular-fluttering, herons (here, a Grey heron) can dissipate heat by adopting a sunning posture. This involves standing upright with the wings held out at the side, shieldlike, but not fully spread.



the Cattle egret, which follows Cape buffalos in Africa and similarly follows cows in its adopted lands. Like other herons, it will also pursue other kinds of disturbance, including tractors and fire.

Feeding in groups does, however, have a disadvantage, in addition to prey depletion. In aggregations, herons can steal prey from one another, with large herons being dominant over smaller ones. Other herons are more independent, and fiercely defend their patch of ground, over which they try to hold exclusive feeding rights. Even when feeding together in an aggregation, herons defend the individual space around them, and may try to take over the feeding sites of others.

Hérons as a whole have many feeding techniques. All species can feed by standing in one place or by walking slowly; some do so characteristically, especially the very large herons that stand in deep water and the small ones that perch from branches overhanging the water. Others use more active behaviors when the situation allows. They may walk quickly or run after a fleeing prey; hop into the air and fly after an observed prey; hover in flight and dip their bill in the water; or even swim about, catching prey on the surface. Certain species can disturb prey into moving by stirring or scraping the bottom with their feet; several have

contrasting yellow feet, apparently for this purpose. Others fly, dragging their feet in the water. The birds also use their wings to frighten prey, flicking them open and shut or else holding them open as they run. They can also attract prey by vibrating their bill in the water.

Various heron species use a succession of behaviors in order to optimize the feeding opportunity of the moment. The Reddish egret uses walking, running, hopping, and flapping wings in order to chase small schooling fish. The Black heron exhibits the most striking behavior of all, running to a chosen spot, forming a full canopy over its head with its wings, then stirring the bottom mud with its feet and stabbing at fish attracted to the canopy or disturbed by the activity.

The use of tools by herons is similarly exceptional. On three continents, Green and Striated herons have been observed using bait and lures. They place the lure (food, feathers, or sticks) in the water and then catch fish attracted to it very much in the manner of an angler presenting a dry fly. At the other extreme, the giant herons will stand for minutes to hours in one place until a suitable fish presents itself. They only need to eat a few per day to meet their energy requirements, and so have perfected a quiet, unobtrusive feeding

style. Bitterns behave similarly, and may take many minutes of excruciatingly slow leg movement to take a step.

The Little egret and similar species tend to have the most varied repertoire. They may stand, walk, hop, fly, or use their feet or wings to catch prey, and may feed alone, in aggregations, communally, or as pirates, as the opportunity arises. Such resourcefulness in first finding and then exploiting ephemerally available patches of prey in effective ways is a key component of the success of the heron family.

Serially Monogamous

BREEDING BIOLOGY

Most herons are gregarious, nesting in colonies with other species, resting in communal roosts, and feeding in aggregations. Bitterns and tiger herons are comparatively solitary, however, and even some typical herons, such as the Capped and Whistling herons, tend to be found in pairs or family groups.

Breeding is often timed to coincide with peaks in food abundance. Herons begin breeding by selecting a display site, where colonial herons gather in groups, using distinctive body postures involving stretching, snapping the bill, site defense, mock preening, flying about, and calling. Solitary herons display using far-carrying calls. Males choose the display site, which usually then becomes the nest site; females choose males by entering their display grounds and withstanding attempts to drive them away. Most species are serially monogamous, although promiscuous mating is common among colonial species. The Eurasian bittern is polygamous, one male mating with up to five females during a single breeding season.

Courtship and pair maintenance ceremonies continue after pairs have formed. Herons build nests of twigs or reeds, often lined with finer material. Depending on species, nests may be massive platforms or token scrapes. Males usually gather the material and give it to the female, who does the building.

A typical heron clutch is 3–5 eggs, with fewer in tiger herons and more in bitterns. Eggs of typical herons are pale blue and unmarked; bittern and tiger heron eggs are white to brown. Both parents guard the nest, incubate the eggs, and feed the young, except in large bitterns, in which the female alone tends the nest. The length of time spent on incubation depends on the size of the heron, being longer in larger species. Incubation begins before the last egg is laid, so the young hatch on different days, giving the oldest an advantage in competing for food, which may help optimize breeding success. It is rare for all the young to survive. Although helpless at hatching, they develop rapidly, especially in the feet and legs, and can scramble out of the nest within days to weeks. Parents feed chicks by regurgitating



Above Representative species of herons and bitterns: **1** Great blue heron (*Ardea herodias*) with fish. **2** Least bittern (*Ixobrychus exilis*) in reeds. **3** Black-crowned night heron (*Nycticorax nycticorax*). **4** South American bittern (*Botaurus pinnatus*). **5** Bare-throated tiger heron (*Tigrisoma mexicanum*); **6** Cattle egret (*Bubulcus ibis*), chasing a potential insect meal.

semi-digested food into the nest or alternatively directly into their mouths.

Most typical herons nest colonially, usually in sites protected from predators. Sometimes they form huge colonies, together with storks, ibises, spoonbills, and other water birds. Some, however – particularly large herons, but also specialized species such as the Whistling heron – nest solitarily. In all but these species, the young disperse after nesting. Adult birds nesting far north or south tend not to remain long in their summer breeding areas before moving toward the tropics.

Bitterns lay their eggs in a nest of reeds at intervals of several days, so the young can be markedly different in age. The chicks leave the nest well before fledging to clamber about among the reeds.

Threatened but Resilient

CONSERVATION AND ENVIRONMENT

Herons are a resilient group. Few bird families have suffered such widespread depredation. In past centuries, hunting by invading humans led to the extinction of island populations. More recently, whole populations were decimated at their breeding colonies to provide plumes for the adornment of ladies' hats. The Royal Society for the Protection of Birds in Britain, the Audubon Society in the USA, and to some extent the entire modern conservation movement owe their existence to the outcry caused by this devastation. Over the ensuing century, most species hardest hit by this trade have survived to reclaim or even expand their ranges. One exception is the Chinese egret, which was long plagued by continued hunting and is now threatened by habitat loss. Herons are still eaten in some areas; in addition, their eggs are sometimes harvested, and adults are killed as unwanted predators.

Habitat loss confronts many species today. Forests and wetlands are under threat throughout the world. The White-eared night heron and the Japanese night heron teeter on the brink of extinction because of relentless habitat destruction. The Chinese egret has been driven from colony sites by coastal development. The White-bellied heron is a rare south Asian species endangered by loss of its wetland and lowland forest habitat.

By and large, however, most species are secure, and many are prospering. Small herons can live almost next door to humans in villages, towns, and even cities. Feeding at dusk and dawn and hiding in deep foliage, the small bitterns, the Green heron, and the confiding pond herons have adapted easily to populated areas. Night herons are a common sight in parks in developed areas. In some parts of the world, almost every zoo and park contains its resident, free-roaming population of herons, which steal the food from the troughs of captive animals. Egrets that nest in rural areas feed alongside cattle, behind tractors, or by the roadside.

Some species are expanding their ranges, reflecting both the dispersal abilities of the group and also its versatility in accommodating to human-made opportunities. The Cattle egret is a good example, having in the past century colonized every continent except Antarctica. As cattle ranching and irrigated pasture expanded, often to the detriment of forests, the bird prospered, spreading to South America and northward into North America as well as in Asia and Australia. And just as the Cattle egret exploited the spread of livestock farming, so other species are now adapting their behavior to take advantage of fish farms, rice fields, reservoir construction, wetland management projects, and similar developments.





Fish farms and hatcheries in fact provide ideal heron feeding sites. In Britain the Grey heron quickly became an expert at robbing unprotected fish farms, as have many herons around the world. Such opportunism brought the birds into conflict with their human providers; in the late 1970s, no fewer than 4,600 Grey herons were shot annually in England and Wales, reducing the total population at one point to only 5,400 pairs. In fact the problem was quickly resolved by cooperation between farmers and environmentalists, who recommended protecting ponds with cords and chains, and Grey heron numbers have since increased in Britain to record levels. Clearly the interaction of herons and aquaculture must be similarly managed worldwide to assure the continued health of these adaptable birds. JAK/JH

◀ **Left** At home near grazing cattle, the aptly named Cattle egret is an opportunistic feeder, which follows large herbivores around, feeding mainly on the insects disturbed by them.

▶ **Right** Both male and female Great egrets care for and feed their young. The chicks stimulate regurgitation by grabbing and tugging their parents' bills. The fledging period is usually around 42 days in this species.

Heron and Bittern Subfamilies

Typical herons and egrets Subfamily Ardeinae

42 species in 9 genera. Worldwide, except high altitudes. Usually near water, but some are more terrestrial. Mostly tropical. Temperate-nesting birds migrate toward the tropics; tropical birds migrate with the wet and dry seasons.

Species include: Grey heron (*Ardea cinerea*), Great blue heron (*A. herodias*), Cooi heron (*A. cooi*), Madagascar heron (*A. humbloti*), Great egret (*A. alba*), White-bellied heron (*A. insignis*), Cattle egret (*Bubulcus ibis*), Green heron (*Butorides virescens*), Striated heron (*B. striatus*), Squacco heron (*Ardeola ralloides*), Indian pond heron (*A. grayii*), Malagasy pond heron (*A. idea*), Black heron (*Egretta ardesiaca*), Little egret (*E. garzetta*), Chinese egret (*E. eulophotes*), Slaty egret (*E. vinaceigula*), Reddish egret (*E. rufescens*), Whistling heron (*Syrigma sibilatrix*), Capped heron (*Pilherodius pileatus*), Yellow-crowned night heron (*Nyctinassa violacea*), Black-crowned night heron (*Nycticorax nycticorax*), Rufous night heron (*N. caledonicus*), Japanese night heron (*Gorsachius gossagi*), White-eared night heron (*G. magnificus*).

SIZE: Length: 39–150cm (15–58in); weight: 200g–4.5kg (7oz–10lb). Males tend to be larger than females, but seldom obviously so.

PLUMAGE: Generally white, gray, black,

and brown, including birds that are entirely white or dark and others that are multi-shaded. Plumage dimorphism occurs. Wide-ranging species vary geographically, particularly island populations. Some juveniles differ from adults, being more cryptically patterned.

VOICE: Flight and disturbance calls are usually harsh, loud croaks, although some, such as that of the Whistling heron, are higher pitched. Calls are used in courtship, and herons can be quite boisterous when together in colonies, roosts, and on communal feeding grounds.

NEST: Generally of twigs placed in trees, bushes, or reeds. Many species nest colonially.

EGGS: 2–7, usually pale blue. Incubation period 18–30 days; nestling period 35–50 days.

DIET: Mainly fish, but also amphibians, small mammals, birds, and insects, the latter especially in terrestrial species such as the Cattle egret.

Bitterns

Subfamily Botaurinae

13 species in 3 genera. Worldwide; large species range farthest N of any heron. Typically found in reed beds, although 1 species occurs in dense, stream-edge tropical forest. Species include: American bittern (*Botaurus lentiginosus*), Australasian bittern (*B. poiciloptilus*), Eurasian

or Great bittern (*B. stellaris*), South American bittern (*B. pinnatus*), Least bittern (*Ixobrychus exilis*), Little bittern (*I. minutus*), Zigzag heron (*Zebrius undulatus*).

SIZE: Length: 27–85cm (11–34in); weight: 100–1,900g (3.5–67oz).

PLUMAGE: Highly cryptic mixture of cream, yellow, chestnut, brown, or black; males are larger and more contrastingly colored.

VOICE: Large bitterns have a booming territorial call; smaller bitterns have barking calls.

EGGS: Usually 3–5, but up to 10 in large bitterns; white to pale brown. Incubation 14–55 days, depending on size; nestling 28–55 days.

DIET: Fish, amphibians, small mammals, insects.

Tiger herons

Subfamily Tigrisomatinae

5 species in 3 genera. Disjunctly distributed in New Guinea, W Africa, C and S America. Tropical wet forests. Species include: Fasciated tiger heron (*Tigrisoma fasciatum*), White-crested tiger heron (*Tigriornis leucolophus*).

SIZE: 60–80cm (24–32in); males larger than females.

PLUMAGE: Brown barred and striped concealment patterns; juveniles patterned more strongly.

VOICE: A booming call.

NEST: Usually in trees.

EGGS: Usually 1, sometimes 2; whitish, blotched red.

DIET: Fish, amphibians.

Agami heron

Subfamily Agamiinae

1 species: *Agamia agami*. S and C America, along tropical forest streams.

SIZE: Length 60–70cm (23–27in); weight: 475–535g (16–19oz).

PLUMAGE: Bright chestnut and blue-green.

VOICE: Alarm call is a low-pitched rattling growl.

EGGS: 2–4, pale blue, unmarked.

DIET: Primarily fish.

Boat-billed heron

Subfamily Cochleariinae

1 species: *Cochlearius cochlearius*. S and C America.

SIZE: Length: 45–51cm (17–20in); weight: 503–770g (17–27oz).

PLUMAGE: Contrasting black and white; juveniles are browner; sexes look alike, but males larger.

VOICE: Characteristic calls are complex, raucous, laughing chants.

EGGS: Usually 3, sometimes 4; pale blue to green, sometimes with cinnamon spotting. Incubation 25–27 days.

DIET: Primarily fish and shrimps.

