

Courtship and Mating

Once a nest site is chosen, the courtship display and mating can occur. Space limitations prevent me from delineating these behaviors for all the herons and egrets, but it seems worthwhile to describe them for one species, the Little Blue Heron (Meanley 1955). The bird courts by shifting from an upright stance to crouching twice, as if pumping its body. Then it stands erect again, rocking from side to side twice. The prospective mate responds by stretching its neck toward the displaying bird, looking at the ground, and then rattling its mandibles. The displaying bird responds in kind. The future mates approach one another and cross necks, continuing the bill rattling for several minutes as well as biting each other's posterior feathers. Courtship often continues from sunrise to sunset. Copulation occurs at the nest. The female crouches as the male grabs her with his feet underneath her shoulders, opening his wings for balance.

The male gathers most of the nesting material and presents sticks to the female. Males remain near the nest while the female lays an average of four eggs in five to eight days. Both parents share incubation, brooding, and feeding duties. For a few days parents regurgitate food to the newly born chicks, but after about a week, the young take food from the bill. After about a month the young birds take their first flight.

The Violence of Heronries

The business of raising young is not without its jagged edges for there is violence at the nest. A mounting body of evidence indicates that siblicide occurs among *ardeids*, espe-

cially Great Egrets (*Casmerodius albus*). Ardeids lay more eggs than they can support. Moreover, they lay their eggs at intervals of one to three days, meaning that the first born have a developmental advantage over siblings who are hatched later. The competition for food decides who survives. If the food supply is great, all the chicks may survive; if it is poor, the younger, smaller chicks are at a distinct disadvantage and their larger, older siblings will overpower them. In this struggle to survive, Great Egret nestlings have been known to kill their siblings (Mock 1985). There is nothing very attractive about egret chick behavior. They stab their weaker brethren with their sharp bills, sometimes until a younger sibling dies (Irion 1994).

Why don't adult egrets stop the killing? Likely, there is a survival pressure to favor the strongest chicks; that is, adult egrets wager on the strong nestlings and allow the weaker ones to be killed or simply driven out of the nests where they are ignored by their parents (Wilder 1984).

Great Blue Herons exhibit much less aggressive behavior, perhaps because they feed their chicks large chunks of fish, five times longer and 100 times heavier than the small prey that egrets bring back to their nests (Mock 1985).

The Ecological Impact of Heronries

Heronries can have a significant detrimental influence on the flora and fauna of the areas in which birds nest. One study looked at the impact on a gum-cypress swamp of a colony in Clay County, Georgia (McDonald 1971). A similar nearby swamp without a heronry was used for comparison. The heronry created several ecological consequences. In the summer, a thick algal mat replaced

the duckweed throughout the colony area.

The swamp that supported the herons also had higher levels of nitrogen and phosphorous caused by the bird excrement in the water. The larger the colony, the greater was the concentration of these chemicals. Nitrogen and phosphorous compounds cause eutrophication of bodies of water, the unnatural increases in the nutrient content of water. One of the primary implications of having large amounts of decaying organic material is that its great demand for oxygen decreases the oxygen content of the water.

In addition, dead tree limbs and defoliated shrubbery marked the flora occupied by nesting birds. It is likely that once toxic levels were reached because of the accumulating excrement, trees and shrubs died, as did the water lilies and other floral life. The algal mat also sustained pollution-tolerant animals such as the microscopic rotifers, ciliated protozoans, and nematodes.

The impact upon water quality is partially determined by the species composition of the heronry. Those species that feed in the swamps are generally recycling local organic material. But Cattle Egrets, which are terrestrial feeders, excrete materials into the water that come from an entirely different ecosystem and therefore introduce other alien elements into the water. In both cases, the result is a changed water quality.

Data suggest that the defoliation wrought by guano alters the nesting patterns of birds (Wiese, 1978). In a large heronry in Delaware, it was found that the shrubs that had been occupied at the center of the heronry were dead and that the ground was denuded. As a result, in 1976, about half the bird population relocated to a nearby area that had not been used before. And after the 1976 nesting season about 60 percent of these