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SOCIAL BEHAVIOR OF NORTH AMERICAN OWLS

by Paul A. Johnsgard

Photographs by
the Author

Social behaviors in animals include a very wide range of interindividual communications, both within and between species. They include such rather generalized social responses as social flocking or roosting behavior, as well as much more individualized and complex interactions such as courtship, aggression, and parental behaviors. Regardless of their complexity, social interactions involve some level of communication or the transmission and interpretation of social signals. These signals can be transmitted in any of several sensory channels, which in owls are most likely to include visual, acoustic, and tactile modes of communication.

Most and perhaps all owls show distinctive postures when they are alarmed and when in threat. The typical alarm posture of perched owls is one that emphasizes their remarkable capacity for remaining immobile and blending into their environment. This apparently concealing posture, appropriately called the *Tarnstellung* (camouflage pose) in German, is

one in which the owl typically stands vertically upright, often against an upright tree trunk if it is available, with the wing nearer the object of fear drawn sideways and upward toward the bill, often hiding most or all of the relatively pale and often conspicuous underpart coloration. The eyes are often almost entirely shut so as to form slanted slits, even in species having dark-colored eyes. However, in some species such as the great gray owl and long-eared owl the eyes remain fully open, and they may even be blinked in the case of the long-eared owl. Additionally, if any ear tufts are present they are erected to their utmost, and the forehead feathers as well as the "eyebrows" are usually spread, often tending to make these areas less conspicuously contrasting. This feather realignment also often causes a pair of dark lines to pass down from the ear tufts past or through the nearly closed eyes, making them considerably less conspicuous than normally is the case. In species such as the scops owl and screechowls the flattened forehead and eyebrow feathers have a color pattern remarkably similar to that of lichen-covered tree bark, producing an extremely effective facial camouflage. Finally, the rictal (mouth) bristles forming the "moustache" are sometimes pushed forward in such a way as to hide or nearly hide the beak.

Embodied silence, velvet soft, the owl slips through the night. With Wisdom's eyes, Athena's bird turns darkness into light. (Joel Peters, "The Birds of Wisdom")

When cornered and facing an opponent, or when protecting a nest, the posture assumed by owls is entirely different. Here, instead of presenting the minimum surface area to view, exactly the opposite response occurs, with the feathers of the head and body fully fluffed, the tail often spread, and the wings both spread and raised above the back or variably drooping. This remarkable posture is somewhat similar to the two-wing stretching behavior of owls and perhaps represents a ritualized derivative of it. In this posture the bird may hiss menacingly, clatter its beak, and in some species sway back and forth in a snakelike hypnotic rhythm while directly facing its opponent.

That this is an innate response is indicated by the fact that I have seen nestlings of eastern screech-owls and barred owls perform this posture perfectly like adults on seeing a peregrine falcon (*Falco peregrinus*) for the first time, even though at that time their wings were only partially grown and their bodies were still mostly down-covered. Similar intense defensive responses have been reported in hand-raised great horned and barn-owls upon initial exposure to snakes. In the common barn-owl this defensive posture is typically associated with seemingly almost unending cycles of head swaying alternated with head shaking, accompanied by puffing or beak-snapping (apparently actually tongue-clicking) sounds. A similar posture to this is assumed by both adult barn-owls and their fledged owlets when threatening one another, and this display is probably more offensive than defensive in motivation. At times this same species may also become prostrate and motionless when it is actually picked up by a human, but such "playing dead" behavior does not seem to be typical of North American owls generally.

An important social behavior for many, and perhaps most, owls is mutual preening (allopreening). Even small owlets sometimes perform this behavior, so it is not necessarily a kind of courtship, but it is certainly engaged in primarily by paired birds and almost certainly is an extremely important pair-forming and pair-bonding type of activity. In the common barn-owl mutual preening occurs regularly between pair members throughout winter, the female usually approaching the male while uttering squeaks or whistles and preening him all over, but especially around the face and the back of

Continued on page 8



The barn-owl is notable among owls in that it has at least 15 distinct calls, as well as tongue-clicking and wing-clapping modes of communication.

Continued from page 6

He [the scritch-owl] keepeth ever in the deserts and loveth not only such unpeopled places, but also those that are horribly hard of access." (*Pliny, Natural History*)

the head and neck. The preened bird responds "with apparent pleasure" by uttering twittering noises and chirrups. Often the two birds doze for a time following such a period of preening. In the great gray owl allopreening is one of the strongest behavior patterns evident during pair bonding. It can be readily elicited by humans from adult wild owls of both sexes, as well as from subadults, by approaching the bird with the top of one's head (hairy, not bald!) toward its face, which stimulates the preening response, even in badly injured birds. Mutual preening in this species probably serves to reduce aggressiveness between individuals and may provide for both sexual recognition and pair-bond maintenance. It has been suggested that although allopreening is known to occur in numerous owl species, its function is still rather uncertain, but it may represent ritualized aggressive biting behavior. It probably is not important as a means of achieving either sexual or individual recognition.

Reduction of danger to both sexes, but espe-

cially to the smaller males, is probably an important aspect of pair-bonding behavior in owls, and it has been suggested that one advantage of the reversed sexual dimorphism typical of most owls is that it allows female dominance to be established at the time of pair formation with a minimum of dangerous aggressive encounters between the two birds, which is obviously advantageous to both sexes.

For probably most owls, a major part of courtship signalling and territorial advertisement consists of calling behavior. This usually occurs during evening and night hours, even in the relatively diurnal species such as the burrowing owl, although in high-latitude breeders of course it regularly occurs during daylight. Probably in most owls these advertisement calls are at least initiated by the male, and are predominantly performed by them, either from perches scattered around the male's territory or as "song-flights" from above it, as in the common barn-owl. Unmated females are probably attracted to such calls and often have distinctive answering calls by which they probably gain entrance into the male's territory and begin to establish individualized contact. Vocal duetting is not uncommonly performed by presumably paired owls and, for example, occurs in such diverse groups as some fish owls (*Ketupa*) and scops and screech-owls (*Otus spp.*), as well as in tawny, long-eared, little and spectacled (*Pulsatrix perspicillata*) owls. Although monogamy is certainly the normal mating pattern in owls, scattered instances of polygamy (bigyny) have been reported in the snowy owl, Tengmalm's owl, and northern hawk-owl.

Courtship displays in owls often involve aerial activities. In the short-eared owl a major courtship display is an aerial wing-clapping display. Like the snowy owl, this open-country species occupies territories that have few if any available elevated perches from which to hoot, and flight displays are an ecologically appropriate type of advertisement behavior. Wing clapping is performed by the male short-eared owl while circling in the vicinity of his territory and occurs before pair formation, thus serving to advertise his availability for mating as well as his being a territory-holder. Courtship calling may often occur during this aerial phase of display, but it was also observed to be uttered by a perched male shortly before copulation. Courtship feeding also often immediately precedes copulation, and in some cases the female

The long-eared owl in defensive posture. Defensive wing-raising is typical of nearly all owls.



flew to the prey-carrying male, whereupon the male performed a food-begging display (opening his wings and fluttering them while presenting the prey in his mouth to the female). Similar passing on of prey by the male to the female occurs at the nest, during both the incubation and brood-rearing periods. Somewhat similar precopulatory behavior, involving food presentation, has been observed in the snowy owl. Courtship feeding has also been observed in many other owls, such as the common barn owl and is probably a regular component of owl pair-forming and precopulatory behavior.

In the common barn-owl a wing-clapping display also occurs, but it is much rarer and less loud than is the case in species of *Asio* (such as long-eared and short-eared) where it has been observed. The "moth flight," an aerial display marked by shallow wingbeats, also occurs in the common barn-owl, as does a repeated "in-and-out" flight during which the male apparently attempts to entice the female into a nesting site. Copulation in the common barn-owl is apparently not invariably associated with prey presentation by the male. Rather it often occurs without apparent prior display when the female begins to "snore" quickly and lowers her body. Thereupon the male mounts her, balancing with his spread wings and holding her nape with his beak feathers. Tongue-clicking, bill-fencing, and cheek-rubbing activities are all regular and important parts of courtship in common barn-owls and are also very commonly performed by owlets once they are old enough to become relatively active.

Nest building does not occur as such in most owls (although nest excavation does occur in some), but simple scrapes are produced by short-eared owls and snowy owls that are later lined (possibly fortuitously) with a few stalks of stubble. The female short-eared owl may do at least some of any nest construction that is performed by this species.

Incubation behavior begins with the laying of the first eggs in most owls, which of course results in staggered hatching times for the young. In the common barn-owl eggs are laid at two- to three-day intervals; thus the eggs normally hatch at intervals of about two days, meaning that in a very large clutch of six to seven eggs there may be more than a two-week span in the hatching dates of the owlets. Certainly in the owl species that have been closely studied only the female is known to incubate;



various reports of male owls assisting in incubation thus need confirmation. Incubation lasts an average of about four weeks in owls, ranging from as little as about twenty-one to twenty-two days in the elf owl to perhaps as long as about thirty-four to thirty-five days in the great horned owl.

During the incubation period the male provides his mate with food for her to consume while sitting, but as soon as hatching has occurred the female passes on much of the food provided by the male to her brood. After hatching, the eggshells may be eaten by the female, carried away and dropped some distance from the nest, or sometimes simply pushed into a corner of the nesting site. Brooding of the young while they are still quite small is quite intense, with the female gathering the huddled

Great gray owl. The enormous circular face of this owl probably functions as a sound-receiving double parabolic disk.

Continued on page 11



Short-eared owl. A ground-nesting owl, the colors of the short-eared owl match perfectly with dead grass.

Continued from page 9

owlets around and under her, virtually enclosing them in her breast feathers and drooping wings. Gradually the female simply stands beside the older owlets, sometimes partially hiding them from view by wing drooping. Eventually the young become old enough that they can safely be left for short periods, while both the members of the pair begin to gather prey. The role of females in prey catching for the young is seemingly rather variable. In the common barn-owl parental brooding gradually ceases when the eldest owlet is about three to four weeks old and the youngest about thirteen to twenty days. Actual fledging requires about fifty to fifty-five days.

In the other North American owls the fledging time varies from as little as twenty-seven to twenty-eight days in the elf, saw-whet, and pygmy-owls to as long as sixty-three to seventy days in the great horned owl. The young of hole- and cavity-nesting owls spend virtually their entire prefledging period safely hidden within the confines of the nesting site, whereas those of such exposed nesting species as snowy, short-eared, long-eared, great horned, and great gray owls often begin to leave their nests for varying lengths of time when they are only about halfway through their fledging period. In the case of the tree nesters, the young owlets soon begin "branching," which consists of clambering about on branches and tree trunks, often even adeptly climbing nearly vertical surfaces while they are still flightless. Similarly the young of snowy owls are able to climb over ground obstacles when only about twenty days old, and young short-eared owls may hide in tall grass some distance from the nest while food is brought to them or dropped from above by their parents.

While owlets are quite young the female common barn-owl cleans the nesting area by eating their feces, although regurgitated pellets are allowed to accumulate. In the long-eared owl, where feces are usually voided over the side of the nest or dropped through its bottom, such nest hygiene may be lacking. Initially the young are often fed rather small prey or torn-up portions of larger prey, but as they grow they are increasingly provided with entire carcasses of larger animals. Observations indicate that sibling owlets rarely steal food from one another, and indeed the older ones may at times attempt to feed their younger siblings, suggesting that sibling killing and associated cannibalism in



owls is probably much rarer than is generally imagined. In common barn-owls cannibalism is just one more by-product of undue stress, whether from severe weather conditions, prey shortage, or nest disturbance. Nevertheless, food competition must play an important role in influencing overall reproductive success.

Horned owl. The nearly hidden white throat area is puffed out and probably serves as a visual beacon during twilight calling.

Paul A. Johnsgard is well known for his perceptive, entertaining, and accurate writing on ornithology. He has received numerous literary honors, including awards from the Library Journal, the Wildlife Society, the Mari Sandoz award from the Nebraska Library Association, and the Loren Eiseley award. This article is an excerpt from North American Owls, by Paul A. Johnsgard. Published by the Smithsonian Institution Press, Washington, DC 20560. Copyright 1988 by the Smithsonian Institution. All rights reserved.