



BREEDING BEHAVIOR

The importance of social display in the life cycle of the Black-billed Magpie, *Pica pica*

Territorial defense, courtship and life-long pair bonds depend on ritualized display behavior

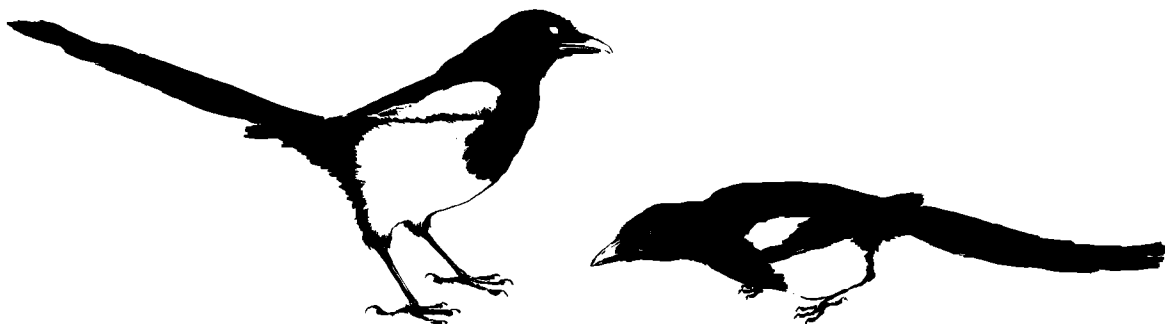
*Craig Scharf and
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In early spring, people living in the Western States and Provinces of North America may find themselves awakened by the strident **shraak-ak-ak** of the Black-billed Magpie (*Pica pica*), proclaiming its territorial sovereignty. The bird, usually a male, can be seen at the top of a tree, its body horizontal and its tail jerking up from below a level position until it is vertical. At the same time the head may be lifted from a low posture until the beak is pointing skyward.

This tree-top tableau is an example of the year-round behavioral displays which are essential to the magpie's reproductive cycle.

The magpie is monogamous although occasionally a pair may part, possibly due to a poor reproductive season. Most pair-bonds begin to develop when juvenile birds flock together during their first year. Although first-year pies usually will not breed, sometimes first-year females may pair-bond and successfully reproduce.

The magpie spends much of its life as part of a group: a family group, a group of juveniles or a group of both juveniles and adults. Within any group there is a strict order of precedence. This dominance hierarchy ranges from the alpha bird, usually the largest male, down through the ranks to the lowliest, most submissive omega bird which is often female. The order of precedence is established through confrontations between birds, varying in intensity from mild, non-aggressive encounters to violent pecking squabbles.





The encounters are often over a food source but can be triggered by mere proximity. In general, confrontations between birds of very different rank, within a dominance hierarchy, are of low intensity and are usually resolved by the low-ranking bird behaving submissively. The most violent conflicts are normally between pies similar in dominance status.

Juvenile flocks form as fledglings become independent of their natal territories. These loose flocks are often composed of birds from adjacent territories, although some young pies may come from farther afield. The function of these wandering juvenile bands is uncertain but it undoubtedly allows young pies to associate and possibly begin the selection of prospective mates. Winter communal roosts, composed of pies of all ages, offer the same pair-bond opportunities.

During late fall and early spring, large numbers of magpies congregate in what have been construed as ceremonial gatherings. Sometimes, where a gathering has occurred, a magpie territory has been established and it has been suggested that these throngs represent pairs of birds competing for a nest-site. Thus the gatherings may facilitate territorial establishment between competing pairs of pies as well as aid in pair-bonding.





At a gathering, mated and unmated pies are very vocal and can be seen dashing about, pursuing one another with great vigor. At times an unusual display flight may be observed. A magpie, probably male, will leave its perch and fly with a slow wing beat in a circle of from fifty to a hundred meters in diameter. It will return to hover in front of its mate or prospective mate and then re-align. Mutual-or allo-preening may then take place.

Allo-preening is a courtship and pair-maintenance activity. Secluded among the leaves of a tree or shrub, one bird will gently rub the tip of its bill through the head and neck feathers of the other bird who will stand attentively. Sometimes both will allo-preen simultaneously. Seemingly enthralled, the pair may be approached quite closely by a careful observer. Low, musical, almost conversational vocalizations may be heard, reminiscent of doves or parakeets.

A pair-bond may form at various times of the year and for differing reasons. Two unattached individuals may be pairing for the first time; a bereaved pie might be replacing a lost mate or a bird may be replacing a mate from which it has parted. The pair-bond becomes apparent when the two birds stay together in the same vicinity. They show less aggression toward each other than to other birds and are more tolerant of each other at a food source.

They may also show cooperation when chasing other birds away. A display of wing- and tail-flirting is given by the female when the two greet each other after being separated. In this display the wings are partially spread and lifted and then rapidly closed. At the same time the tail is jerked up and often fanned. While the female is displaying, the male usually adopts an alert posture with the neck slightly stretched, bill pointing straight ahead and the tail might be raised. Both birds utter a low, begging **cheeuk** or the female, if the male alights very close to her, may give a soft, high-pitched **kirrr**.

With the approach of the breeding season the paired birds show much cooperation in the construction or refurbishing of their nests. Both are involved in building the platform and the superstructure but the female often concentrates on the inner nest-bowl while the male finishes the outer domed covering.

A pair of magpies will cooperate in guarding their territory which they will defend throughout the year. During non-nesting periods, however, they will sometimes permit other pies within their territorial boundaries, particularly if the trespasser is suitably submissive when confronted. This tolerance of intruders decreases and disappears as the nesting season approaches, when intruding pies constitute more of a sexual threat.





If a nomadic pie intrudes, the resident male may make a swooping, intimidating flight to within inches of the trespasser. If the intruder does not take flight, a major battle might ensue.

The resident pie will often start the fight by jumping up and kicking the side of the intruder and may also peck at its head. The trespasser may similarly defend itself. It has been noted that territorial male can lose up to a third of its head feathers, establishing and maintaining its territory each spring. If the scuffle continues, a bird might be seen on its back, wings outstretched and feet extended in defense with the other bird standing on its chest, pecking violently at its head. Usually the contest ends with the intruder beating a hasty retreat.

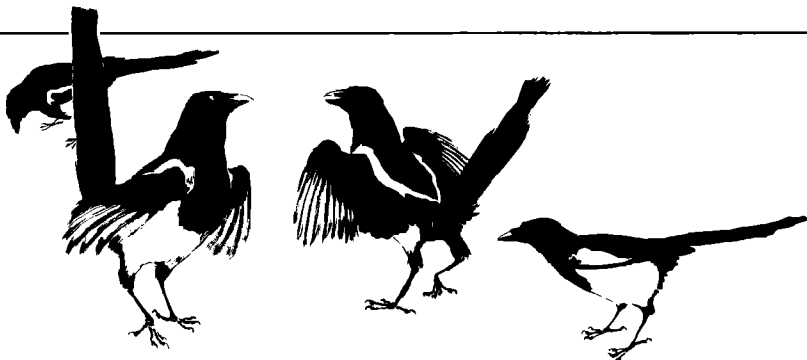
Interactions between territorial neighbors might initially be of the same severity during the fall and early spring but the intensity decreases as boundaries become well established and respected. When this happens, territorial boundary displays may be observed. Neighboring males will assume the high-up, alert posture. The wings are held out from the body at varying degrees and are quivered. The tail is held high and sometimes pointed forward over the pie's head. The posture is indicative of an aggressive, dominant individual. Both males will maintain the posture for several minutes, strutting back and forth along their mutual boundary.

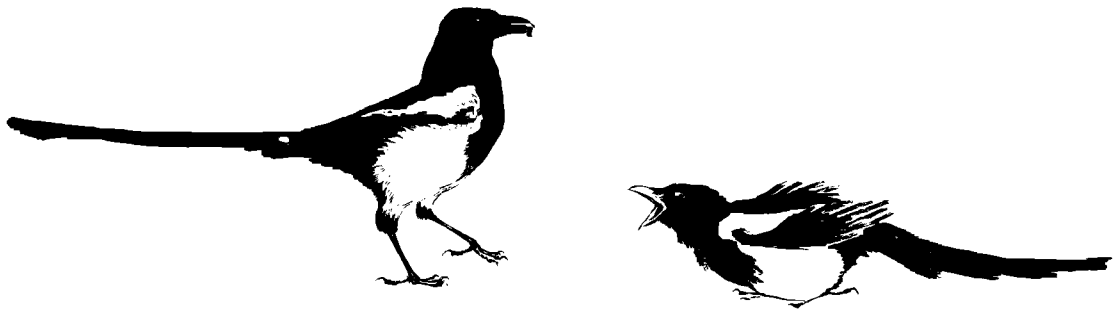
Morphological Characteristics

Bill Length (Gape to tip of Bill)	38-45mm
Wing-chord	185-220mm
Tail Length	235-320mm
Weight	160-220gms

Nesting Information

Start of Nest Building	December-January
Start of Egg Laying	Mid April
Range of Clutch	4-9
Egg Size	32.54 × 22.86 mm
Egg Weight	8.58-10.07gms
Incubation Period	17-20 days
Brooding Period	25-30 days





A strident **cheeruk** is frequently and alternately uttered by both birds. The females often adopt a similar posture while remaining in the background. Eventually the confrontation subsides with the females leaving the scene first, followed by the males.

As egg-laying approaches, the male magpie becomes more attentive and seemingly protective of his mate, often following her about as she forages. This attention may be to protect the female from maverick pies who might try to copulate with her. During this period, the female magpie occasionally visits the nest and will sometimes sit inside for a while.

Courtship feeding between pairs may occur sporadically throughout the year and increases just prior to egg-laying. Finding a morsel of food, the male magpie will approach the female who may then adopt a begging posture. In the begging posture, the female will crouch with the head tilted up and the tail slightly spread close to the ground. Particularly during the nesting period, the female will solicit courtship feeding by approaching the male in the begging posture, giving a loud **cheeuk**, repeated at short intervals. Courtship feeding may not only help the female in her nutritional requirements during the production of eggs but may also encourage the male in the process of food transference as he will largely be responsible for providing food for his mate and the hatchlings, during incubation and brooding.

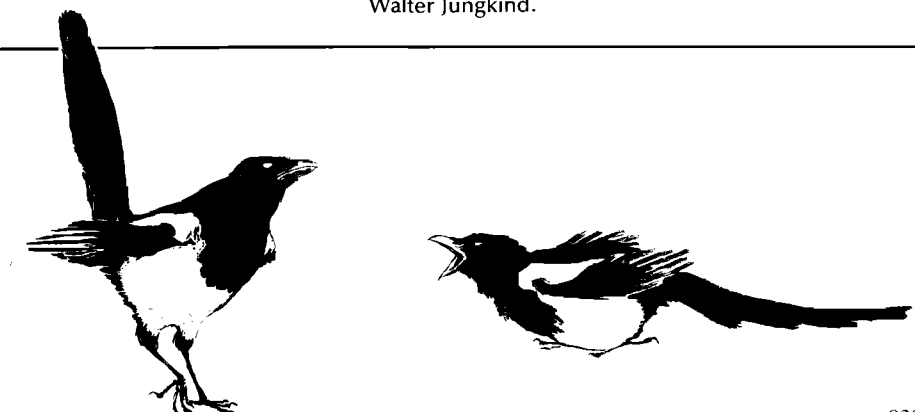
Copulation occurs as early as a week before egg-laying and may continue until a week after the clutch has been laid. The prospects of all the eggs being fertilized are increased by the frequency of the copulations during the egg-laying period. The female magpie may solicit copulation using the same vocalizations and postures used to solicit courtship feeding. Observations at this time may be equivocal. When the male is ready to copulate he may circle the female in the upright posture with the tail held above the horizontal and the white shoulder patches fluffed up. The female, possibly in a begging posture, may approach the male who will wing-flirt, holding his quivering wings outstretched horizontally. If the female is ready she will squat, spreading her tail feathers. The male will mount onto her back, holding his wings open for balance. At this point, the female may stand up and walk away, causing the male to lose balance and dismount but if both birds are in accord, they will twist their tails, bringing their cloacae together and allowing the transfer of sperm to take place.

(continued next page)

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Hatching occurs approximately eighteen days after the last egg has been laid. The brood of young magpies are soon confronted with the social structure which will dominate their lives on leaving the nest. The nestlings form a dominance hierarchy in relation to the acquisition of food brought to them by the parents. The order of precedence is characterized by the size of the individuals within the nest, the largest often maintaining its access to food by placing its outstretched wings over its siblings until it is satiated. The acquisition of food by the remainder follows a gradient from the largest to the smallest. When the young fledge, they often stay within their parents' territory for some time and the dominance hierarchy established in the nest is maintained by subtle postures and signals. Eventually, the fledglings will begin to interact with other magpies and the reproductive cycle and its associated reproductive behavior will have come full circle.

Thus it would appear that the maintenance of the pair-bond by year-round behavioral displays is of intrinsic value to the ultimate reproductive success of resident, monogamous birds such as the Black-billed Magpie.

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