# SECOND-YEAR MANAGEMENT OF A CLIFF SWALLOW COLONY IN MASSACHUSETTS

by Mara Silver

The impetus to study the conservation status of the Cliff Swallow (*Petrochelidon pyrrhonota*) was provided in the summer of 1990, when these birds nested on my house in Cummington, Massachusetts. The house has a substantial roof overhang and exposed rafter ends. Of the twenty-one Cliff Swallow nests built on the house by early June, all but two were usurped by House Sparrows; of the remaining two, one fell. I wondered: What could be happening to Cliff Swallows regionally? Could these problems be affecting other colonies to this extent?

In the summer of 1991, under sponsorship of the Massachusetts Natural Heritage and Endangered Species Program, I studied a second Cliff Swallow colony at Graves' farm in Williamsburg, Massachusetts, located about ten miles east of the Cummington site. Cliff Swallows nesting at Graves' farm in May had, by July, suffered major setbacks from competing House Sparrows and fallen nests (Silver 1991).

With the support of the Massachusetts Audubon Society, the Graves' farm site was again monitored in the summer of 1992. In addition to work at Graves' farm, which included testing several management techniques, I conducted a survey of active Cliff Swallow colonies in Massachusetts to help determine potential management techniques for many Cliff Swallow colonies.

## Natural History and Ecology

Cliff Swallows are members of the family Hirundiniae, the swallows and martins. They are a migratory, highly colonial species; the birds travel between South America and large areas of North America.

In New England the breeding season lasts from early May until early August. The birds build bottle-shaped mud nests under the eaves of buildings and bridge superstructures. Once paired, both sexes participate in nest-building. Clutch size averages three to four eggs. Both parents incubate eggs and feed nestlings. The incubation period is twelve to fourteen days, while the nestling period is approximately twenty-four days. There are occasional second broods. Parents continue to feed fledglings before all the birds leave for South America. The breeding activity within a colony is closely synchronized.

## Historical Overview

In the eastern United States, nesting Cliff Swallows have historically been associated with buildings. The first written account of their occurrence in the eastern United States is from a natural site on the Ohio River in Kentucky in

1815 (Audubon 1967). The first recorded sightings of breeding Cliff Swallows in Massachusetts were in Hingham and Attleboro in 1842 (Bent 1942). Henceforth, Cliff Swallow populations increased greatly as more buildings became available for nest sites and fields were cleared for farming (Bent 1942). Cliff Swallow populations peaked in the eastern United States between 1840 and 1860 (Forbush 1908). A slow population decline commenced in about 1880, when introduced House Sparrows began to spread throughout New England (Forbush 1929; Bull 1964). House Sparrows, as cavity nesters, compete directly with Cliff Swallows (Samuel 1969). Another factor contributing to the decline was the increase in painted barns, to which the swallows' nests adhere poorly (Forbush 1929). By the turn of the century they were not considered common in Massachusetts, except in Berkshire County (Bagg and Elliot 1937). The decline has continued in this century due to the factors mentioned above, as well as to loss of open agricultural land, habitat loss due to development, and destruction of wetlands.

## Current Status of Cliff Swallows

Table 1 shows 1992 data on Cliff Swallow colonies from all counties in Massachusetts. These data likely do not include every Cliff Swallow colony in the state, especially in Berkshire County.

The swallows' success seems to hinge upon their ability to survive either depredation by House Sparrows or the falling and resultant destruction of their nests and young. At a farm in Williamsburg, Massachusetts, all of about thirty nests were usurped by House Sparrows. There were no signs of fallen nests at this site. Fourteen pairs were counted at a Hadley, Massachusetts, farm, but only three survived harassment by House Sparrows. Again, no fallen nests were found. At other sites, nests were built on supports such as a strip of wood or a wire tacked to a house. At one location in Shelburne, Massachusetts, five nests were built on to old Barn Swallow nests. Some colonies that nest on bridges are more successful. Observations of House Sparrows harassing bridge-nesting swallows in urban areas have been reported (Weatherbee pers. comm.).

Human intervention has been effective in many instances in preserving Cliff Swallow colonies. Intervention strategies included trapping or shooting House Sparrows (Buss 1942; John and Dwight Graves pers. comm.) and attaching artificial plaster nests to structures used by nesting swallows (Bull 1974). (Unlike most North American birds, House Sparrows are not covered under federal protection laws that would prohibit shooting them or using other means of control.) Between 1957 and 1960, and 1970 and 1972, a wildlife biologist in North Dakota shot and trapped House Sparrows, realizing a greater than eighty percent yearly increase in the number of breeding Cliff Swallows at the managed colony (Krapu 1986).

**Table 1. Status of Cliff Swallows in Massachusetts in 1992**

| County | Town | Number of pairs |
|---|---|---|
| Berkshire | | |
| | Adams | 75 |
| | Cheshire | 25 |
| | Great Barrington | * |
| | New Lennox | 7 |
| | North Adams | 5 |
| | Pittsfield | 9 |
| | Sheffield | * |
| | West Stockbridge | * |
| Franklin | | |
| | Charlemont | 5 |
| | Conway | 11 |
| | Shelburne | 4 |
| Hampshire | | |
| | Belchertown | 7 |
| | Cummington | 18 |
| | Florence | 4 |
| | Hadley | 6 |
| | South Hadley | 14 |
| | Westhampton | 6 |
| | Williamsburg | 62 |
| Hampden | | |
| | Bondsville | * |
| | Ludlow | * |
| | Palmer | 10 |
| Worcester | | |
| | Brookfield | * |
| | East Brookfield | 6 |
| | Lunenburg | 23 |
| | Princeton | 3 |
| | Rutland | 8 |
| | Templeton | 8 |
| | Winchendon | 5 |
| Essex | | |
| | Gloucester | 9 |
| | Haverhill | 5 |
| | Merrimac | * |
| | Newbury | 15 |
| Plymouth | | |
| | Marshfield | 24 |
| | Middleboro | 25 |
| Middlesex | | 0 |
| Norfolk | | 0 |
| Suffolk | | 0 |
| Bristol | | 0 |
| Barnstable | | 0 |
| | TOTAL | 399** |

* Presence confirmed, numbers unknown.

** If the average of 15 pairs is assumed at sites where presence is confirmed but numbers are unknown, the total increases to 504 pairs statewide.

With one exception, data on present Massachusetts colony locations reflect little or no human intervention on behalf of nesting Cliff Swallows. At a farm in Adams, presently the site of the largest colony in Massachusetts, House Sparrows are baited to an empty silo and shot (Edwin Clairmon pers. comm.). Additionally, the farmer reported that most incidences of nests falling from his barn occurred on a newer section with smooth painted wood. The older section is unpainted rough-cut pine.

### Management Strategies At Graves' Farm

At Graves' farm I instituted management techniques to protect the Cliff Swallow colony. While it is too early to draw conclusions about the effect of intensive management upon the colony, preliminary indications are that the swallow population can recover quickly if the most formidable obstacles are reduced or eliminated. Eight pairs of Cliff Swallows arrived at Graves' farm to breed in the spring of 1991. Of the eight pairs, two were successful. In 1992, of the thirty pairs that bred at Graves' farm, thirteen to fifteen were successful. Some breeding periods seemed excessively long, perhaps because of undetected House Sparrow depredation (see below) at various times during the nesting season.

**House Sparrow Control.** House Sparrow populations were controlled by several shooting or trapping methods. Shooting House Sparrows was most effective, but the sparrows became increasingly wary. Approximately three-quarters of the sparrows were eliminated in two weeks, but the remainder required an additional two months. On June 25 and 26, two unpaired males, the only remaining House Sparrows, destroyed fifteen nests, pecking young and pulling them from nests. The young Cliff Swallows were very vocal and may have induced the attack. Because even two sparrows can have significant effects on Cliff Swallow colonies, constant intervention is essential to control the sparrows and protect the swallow colony.

Despite the use of various designs, trapping resulted in only two captured House Sparrows. Other bird species were more likely to be trapped, although trapping has been effective in other instances (Krapu 1986).

**Artificial Nests.** The chestnut rafters on which the swallows at Graves' farm built their nests are painted on the south side and unpainted on the north side. Nests fell equally from both sides. In 1991 seven of twelve nests (including rebuilt nests) fell. In 1992, in order to determine if the composition of nests affected nest adhesion, thirty gallons of clay were added to the two-foot by three-foot mud puddle used by the swallows for nesting material. Eleven out of thirty nests fell. The 1992 season was wet and humid. Most nests fell after a rain storm, when the sun came out and humidity was high. Marauding House Sparrows likely caused nests to fall, but this matter requires further investigation.

In late April 1992 three fired, crescent shaped, brown stoneware clay ledges were attached to the eaves of the barn. It was hoped that the swallows would build on to them. One of the three was attached to a part of the eave traditionally unused by Cliff Swallows and was ignored. Of the two attached to the previously used section of the eave, one was utilized. This nest successfully reared offspring.

In 1991 chicks from fallen nests were returned to eaves in plastic bottles and on wooden platforms. The parents investigated but abandoned these chicks. Seven nests containing chicks fell during the 1992 breeding season. The chicks from every fallen nest but one were found alive and returned to substitute clay nests. In every case, the parents accepted the substitute nest and began feeding their chicks within a few hours. The older and louder chicks were tended to more quickly than the younger silent chicks. These substitute nests were made of unfired mud-colored clay, molded to simulate a Cliff Swallow nest, textured on the inside, and screwed to the exact site on the eave from which the nest had fallen. Substitute nests could have been fired, but when unfired, are more lifelike, although they had to be handled with care.

Fired clay ledges appear to offer effective support for the swallows' nests. Additionally this strategy is proactive, allowing the birds to carry out normal nesting activities. Substitute nests are more like a rescue operation than a management technique. The failing of nests is life-threatening to chicks and dramatically disrupts the rhythm of nesting.

## Conclusion

Two years of study indicate that human intervention can play an important role in conserving the species. It is unclear which problem, falling nests or House Sparrow depredation, results in greater losses to nesting Cliff Swallows. In addition to these obstacles, weather plays an important role. Cliff Swallows are vulnerable to cold, wet weather and are likely to starve to death in these conditions (Krapu 1986). A colony in coastal Ipswich, Massachusetts, was depredated in two consecutive years by wind and high water (Townsend 1905). To evaluate and then perhaps apply some of the experience gained at Graves' farm to a broader conservation effort is a complex task.

Constant observation is necessary during the nesting period of Cliff Swallows. Such vigilance seems unlikely unless many people are available (perhaps in shifts) to watch a particular colony. It is helpful, but not essential, that observers can use firearms to help control House Sparrows.

Individual sites would require different management strategies. The Graves' farm colony is unique because there are no restrictions on management activity. This may not be the case on other private or public property. Colony sites would have to be evaluated to determine whether management activities are permissible and, if permissible, which activities would be practical. The optimal

sites would be similar to Graves' farm, i.e., conservation land or relatively isolated farmsteads.

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**MARA SILVER** graduated from the College of the Atlantic in 1987. Since then, she has participated in many ornithological studies that have taken her to the Maine coast as well as the British Isles. For the past three years, Mara has been especially interested in Cliff Swallow conservation.


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