CLIFF SWALLOWS

Integrated Pest Management Around the Home

Swallows, particularly cliff swallows, *Hirundo pyrrhonota* (Fig. 1), often live in close proximity to people. While enjoyable to watch, cliff swallows nesting in colonies on buildings and other structures can become a nuisance. Their droppings can foul machinery, create aesthetic problems, and cause potential health hazards by contaminating foodstuffs. Their mud nests eventually fall to the ground and can cause similar problems. In addition, swallow nests frequently contain mites and insects such as swallow bugs (*Oeciacus vicarius*); swallow bugs are related to bed bugs and will bite humans, although humans are not their usual host.

Seven members of the swallow family breed in California: the tree swallow (*Tachycineta bicolor*), violet-green swallow (*Tachycineta thalassina*), purple martin (*Progne subis*), bank swallow (*Riparia riparia*), rough-winged swallow (*Stelgidopteryx serripennis*), barn swallow (*Hirundo rustica*), and cliff swallow. The first three nest in cavities such as woodpecker holes or birdhouses. The bank and rough-winged swallows nest in natural crevices or burrows dug in earthen banks. Barn and cliff swallows build mud nests attached to buildings and other structures, a habit that sometimes puts them into conflict with people. This is particularly true of the cliff swallow—the swallow of San Juan Capistrano—which nests in large colonies of up to several hundred pairs. In contrast, barn swallows tend to nest as single pairs and, consequently, do not cause many problems.

BIOLOGY

Swallows feed on insects and spend a large part of each day in the air catching flies, beetles, and mosquitos. Their long, pointed wings give them great speed and maneuverability. Normally, swallows are not seen on the ground except when collecting mud for their nests. Most do not have musical voices but only twitter or squeak.

The cliff swallow is 5 to 6 inches in length and is the only square-tailed swallow in California. In contrast, the barn swallow is distinguished by its long, deeply-forked tail. The cliff swallow is also recognized by its pale, orange-brown rump, white forehead, dark rust-colored throat, and steel-blue crown and back.

Distribution and Habitat

Cliff swallows are found throughout California, except in high mountains and the dry southeastern desert. Four basic conditions are found at all cliff swallow colonies: (1) an open habitat for foraging; (2) a vertical surface beneath an overhang for attaching the nest; (3) a supply of mud that has the proper consistency for nest building; and (4) a body of fresh water for drinking.

The original nesting sites of cliff swallows were cliffs and walls of canyons. Structures, such as buildings, bridges, and overpasses, and agricultural activities have increased the number and distribution of suitable nesting sites, and cliff swallow populations have increased accordingly. In general, wherever irrigation water and buildings or other structures are found, suitable breeding conditions may exist.

Cliff swallows spend the winter months in South America. In late winter and early spring, they begin a northward migration over land through Central America and Mexico. Arrival dates can vary greatly because of weather conditions. Usually by late February or early March, the first migrants appear in southern California. Two or three weeks later, cliff swallows begin arriving in northern California. Cliff swallows migrate during the day and catch flying insects enroute. Swallows will not penetrate regions unless flying insects are available for food, which usually occurs after a few days of relatively warm weather (70°F or more).

Figure 1. Adult cliff swallow.

Site Selection

Cliff swallows arrive at nest colonies in successive waves. A definite homing tendency exists among adults that previously nested at a colony. These birds are the first to return, followed by adults who bred at other colonies in previous years and by young birds who have not yet bred. The younger birds include individuals not born at the selected colony.

In addition to their homing tendency, breeding swallows are attracted to old nests. Under suitable conditions, a nest is quite durable and can be used in successive years. Old nests are usually claimed on the first day of arrival, although probably not by the original makers. Dilapidated nests are quickly occupied and repaired.

PEST NOTES **Publication 7482**

University of California
Division of Agriculture and Natural Resources

November 2000

Figure 2. A cliff swallow nest.

Nest Construction

Cliff swallow nests are gourd-shaped enclosed structures built of mud pellets, consisting primarily of sand with smaller amounts of silt and clay (Fig. 2). (In contrast, barn swallow nests are cup-shaped and the pellets contain coarse organic matter such as grass stems, horse hairs, and feathers.) The cliff swallow nest chamber is globular and extends forward into an entrance tunnel that opens downward. The tunnel may be absent from some nests. Nest dimensions vary from $5^{1}/_{2}$ to $10^{1}/_{2}$ inches in length and $5^{1}/_{2}$ to 8 inches in basal width, and the opening averages $1^{3}/_{4}$ inches in diameter. The nest is cemented with mud under the eave of a building, bridge, or other vertical surface. Usually the first nests are located at the highest point possible with subsequent nests attached below it, forming a dense cluster.

Both sexes construct the nest, proceeding slowly to allow the mud to dry and harden. Depending on mud supply and weather, nest construction takes 1 to 2 weeks. Mud is collected at ponds, puddles, ditches, and other sites up to $^{1}/_{2}$ mile away, with many birds using the same mud source. A typical nest contains 1,000 to 1,400 mud pellets, each representing one trip to and from the nest. Cliff swallows sometimes build two or three nests per season; not all nests are used, however.

Egg Laying

Egg laying usually begins before the nest is completely finished. Each day one egg is laid until the clutch of three to four eggs is completed. In central California, egg laying generally occurs between late April and the end of May. In southern California nesting can begin during late March and in the extreme northeastern part of the state as late as June. Within a colony the date of egg laying varies because of the staggered arrival dates of the birds.

Nest Failures

Renesting will occur if nests or eggs are destroyed. For example, nests may fall because they were built too rapidly or they may crumble because of prolonged humid weather. House sparrows (*Passer domesticus*) sometimes take over empty swallow nests and have been known to drive off swallows from new nests. A cliff swallow nest taken over by house sparrows is identified by the abundant nest lining (grasses, weeds, and feathers) protruding from the entrance.

Hatching and Feeding

Both sexes incubate the eggs, which hatch in 15 or 16 days. The adults are kept busy feeding the nestlings by foraging over an area sometimes 2 to 4 miles from the nest. Occasionally, long periods of continuous rainfall make it difficult for the adults to find food and they may abandon the nestlings. A sign of a successful nest is white excrement rimming the nest entrance, indicating the presence inside of young swallows.

Fledging and Post-nesting Period

In mid-May to mid-June, 20 to 25 days after hatching, the young birds fledge (take their first flight). They look similar to adults but are dull colored and have less sharply defined color patterns. The young will return to the nest for 2 to 3 days to be fed before leaving it permanently. They remain near the colony for about a week.

In California most cliff swallows raise one brood each year, although some may raise two. The time required from the start of nest building to departure after raising one brood is 47 to 64 days. Swallows are usually present at the colony for up to 100 days.

After leaving the nesting colony, cliff swallows will remain in the general area for several weeks. By mid-August there is a general southward movement, and by the end of September few swallows remain, except in southern California where a few linger into October.

MANAGEMENT

Actions to solve problems with swallows should be started as soon as they are identified. Cliff swallows are colonial and the number of nesting birds can increase significantly from year to year. They are best managed by nest removal and exclusion techniques. There are no chemical toxicants registered for cliff swallow control, and shooting, trapping, or harming swallows is not permitted.

Legal Status

All swallows are classified under the Migratory Bird Treaty Act of 1918 as migratory insectivorous birds and are protected by state and federal regulations. It is illegal for any person to take, possess, transport, sell, or purchase them or their parts, such as feathers, nests, or eggs, without a permit. As a result, certain activities affecting swallows are subject to legal restrictions.

Permit Requirements

Depending on your location, a depredation permit issued by the U.S. Fish and Wildlife Service may be required to remove cliff swallow nests. In the western administration region of the U.S. Fish and Wildlife Service, which includes California, a permit is not required to remove nests under construction that do not contain any new eggs or young, or nests abandoned after the breeding season. In other regions a permit may still be required for removing the above nests.

In all regions of the country, if new eggs or nestlings are present in the nests, a permit authorizing nest removal or the use of exclusion techniques is required. A permit will be issued only for very compelling concerns for human health and safety. Some examples are concerns for aircraft safety from a nesting colony at an airport or potential food contamination from a colony over a loading area at a food processing center. In most cases a permit for lethal control will not be issued for swallows nesting on a residence or other buildings causing aesthetic damage.

For all permit requirements, contact the main office of USDA-APHIS Wildlife Services in your state. In California the address is P.O. Box 255348, Sacramento, CA 95865-5348, phone (916) 979-2675.

You will be referred to a district biologist who will assess the problem and make control recommendations. If lethal control is recommended, then a permit application must be completed and sent to the U.S. Fish and Wildlife Service regional office along with a fee ($25 in 2000).

Timing is critical. It usually takes 10 to 14 days to obtain a permit so you must plan ahead if a problem is expected. It is not advisable to wait until nest building begins to apply for a permit, because swallows build their nests and lay eggs in a short time. Egg laying begins before nest contruction is completed; eggs may be present once the nest reaches the cup stage, at which point a permit usually will not be issued. For those regions that require a permit, if a swallow problem has been experienced in the past at a site and is expected to reoccur, then apply for a permit in advance of the birds' return.

Nest Removal

In areas where a permit is required, the nest removal method will be specified by the permit. In California, old nests or nests under construction may be washed down with water or knocked down with a pole. Swallows are strongly attracted to old nests or to the remnants of deteriorated nests, so all traces of mud should be removed. During nest building, nest removal will require many days because cliff swallows persistently rebuild nests for most of the breeding season. They usually return the following year and the whole process must be repeated.

Exclusion

Exclusion refers to any control method that denies physical access to the nest site area. Exclusion represents a relatively permanent, long-term solution to the problem. In California, a permit is not required for this method if it is done before the birds arrive, during nest building when there are no eggs or young in the nest, or after the birds have left for the winter. If swallows have eggs or young in the nest, exclusion may not be used without a permit.

Netting can provide a physical barrier between the birds and the nest site. The mesh size should be 1/2 to 3/4 inch; however, 1 inch has been used successfully. If a plastic net is used, it should be attached so that it can be pulled taut. This prevents flapping in the wind, which looks unsightly and results in tangles or breakage at mounting points. The net should not have any loose pockets or wrinkles that could trap and entangle birds.

Attach netting to buildings before the birds arrive and leave it up permanently or remove it after the nesting season (Fig. 3). Netting can be attached using tape, staples, or hooks on the eaves and the side of the building. An advantage of hooks is that the net can be taken down during the nonbreeding period or for maintenance of light fixtures, painting, etc. If staples are used, they should be rust-resistant to avoid unsightly rust stains on the building. For netting, a supporting framework of wooden dowels, wood laths, or metal rods along the edges will ease attachment to the hooks and create more even tension on the net. Netting may also be wrapped once or twice around wood laths and nailed directly to the building. The netting should extend from the outer edge of the eave down to the side of the building where the protection

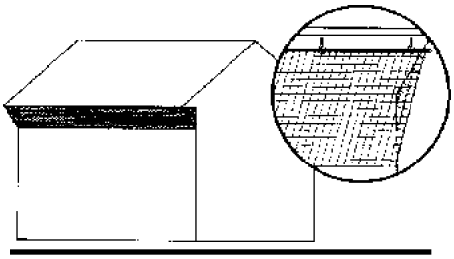

Figure 3. Mount netting from the outer edge of the eave down to the side of the building. Insert shows one possible method of attachment using hooks and wooden dowels.

from the elements given by the eaves is lost (Fig. 4a). Be sure there are no openings in the net where swallows might enter.

Some individuals have reported that hanging a curtain of netting from the eave will prevent nesting (Fig. 4b). The curtain should be 3 to 4 inches from the wall and extend down from the eave 18 inches or more.

Blocking the entrance will prevent cliff swallows from nesting inside buildings. Hang netting or strip doors of vinyl plastic or similar material across the entrance like curtains, allowing passage of vehicles, materials, or people (Fig. 5). Weighting the bottom of the netting will help keep it reasonably taut and in position during windy weather. Cliff swallows have been known to abandon nests inside a barn loft when the entrance was partially closed, reducing it to less than 8 x 8 feet.

Usually, swallows will not fly into a net but will stop and hover in front of it. If only that section of a building where swallows have nested is netted, the swallows will often choose alternative sites on the same structure. Therefore, any part of a building suitable for nesting must be netted. After the netting or wire mesh is installed, monitor the area for entry points and make necessary adjustments.

Other Methods

Nesting is sometimes discouraged through the use of metal projectors (Fig. 4c). These are sharp, needlelike wire or plastic devices generally installed along building ledges and windowsills to discourage birds from roosting (Fig. 6). This method is not always successful in preventing swallows from nesting. In one instance cliff

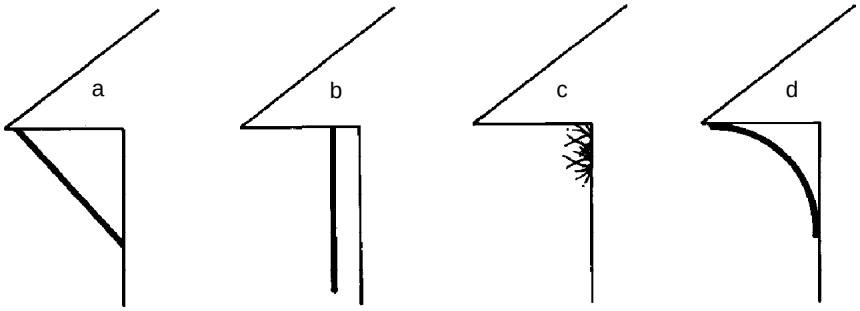

Figure 4. Four methods that may deter cliff swallow nesting: (a) netting attached from the outer edge of the eave down to the side of the building; (b) a curtain of netting; (c) metal projectors attached along the junction of the wall and eave; (d) fiberglass panel mounted to form a smooth, concave surface.

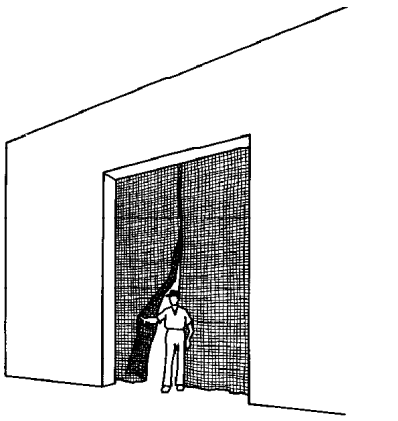

Figure 5. Netting hung like a curtain across a large entrance of a building.

swallows learned to land on the metal spines and eventually built nests attached to them. Attach the sharp projectors to cover the area where swallows prefer to build nests, especially horizontally along walls protected by eaves. Additional projectors running vertically should be attached along interior corners. Once installed, projectors are left in place permanently.

Fiberglass panels that are 6 inches wide have been used to prevent nesting in some situations (Fig. 4d). The panels are installed between the eave and wall forming a smooth, concave surface that makes nest attachment difficult.

Modification of the surface where swallow nests would be attached sometimes effectively discourages nesting. Swallows prefer rough, uneven surfaces that provide a good foothold and suitable surface for nest attachment. Removing the rough surface of the wall and overhang can make the site less attractive to swallows. Attaching glass, sheet metal, or other very smooth-surfaced materials to the potential nest site can inhibit swallow nesting. A fresh coat of paint producing a slick surface may discourage nesting. Removing old nests and painting the area may discourage nesting the following year.

Other methods have shown little success or are unproven against cliff swallows. These include employing hawk, owl, or snake models or using taped alarm calls, noisemakers, revolving lights, and chemical roost repellents.

Sources of Control Material

A partial list of sources of supply for netting and metal or plastic projectors is given below. Netting is also available at many hardware and farm supply stores.

NETTING

Bird Barrier America
20925 Chico St.
Carson, CA 90746
(800) 503-5444, (310) 527-8000;
fax (310) 527-8005
www.birdbarrier.com

Sutton Agricultural Enterprises, Inc.
746 Vertin Ave.
Salinas, CA 93901
(831) 422-9693; fax (831) 422-4201

Wildlife Control Technology, Inc.
2501 North Sunnyside Ave.
Fresno, CA 93727

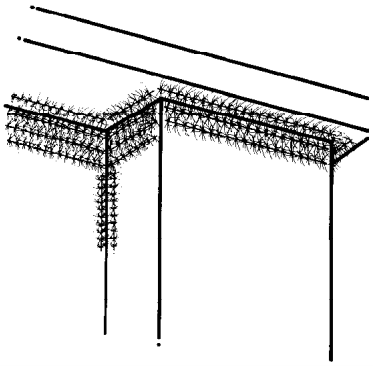

Figure 6. Mount metal projectors horizontally along walls protected by eaves and vertically along interior corners.

(800) 235-0262; fax (559) 490-2260
www.wildlife-control.com

METAL OR PLASTIC PROJECTORS

Bird-X, Inc.
300 North Elizabeth St.
Chicago, IL 60607
(800) 662-5021; fax (312) 648-0319
www.bird-x.com

Cat Claw, Inc.
Box 5250
Johnstown, PA 15904
(800) 832-2473; fax (800) 732-0380
www.catclaw.com

ECOPIC
725 S. Adams Rd., Suite 270
Birmingham, MI 48009
(313) 647-0505; fax (313) 647-7811

The Huge Company
7625 Page Boulevard
St. Louis, MO 63133
(314) 725-2555; fax (800) 873-4843

Nixalite Company of America
P.O. Box 727
East Moline, IL 61244-0727
(800) 624-1189; fax (309) 755-0077

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

AUTHORS: T. P. Salmon, W. P. Gorenzel
EDITOR: B. Ohlendorf
TECHNICAL EDITOR: M. L. Flint
DESIGN AND PRODUCTION: M. Brush
ILLUSTRATIONS: adapted from *Cliff Swallows: How to Live with Them,* Salmon,T. P., and W. P. Gorenzel.1981. Oakland: Univ. Calif. Div. Agric. Sci. Leaflet 21264

PRODUCED BY IPM Education and Publications, UC Statewide IPM Project, University of California, Davis, CA 95616-8620

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash nor pour pesticides down sink or toilet. Either use the pesticide according to the label or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.