

CLIFF SWALLOW

TAXONOMY

Scientific name: *Petrochelidon pyrrhonota* (Vieillot, 1817)

Common name: Cliff Swallow

Family: Hirundinidae

Taxonomic comments:

Formerly placed in genus *Hirundo* along with Cave Swallow *Petrochelidon fulva* and Barn Swallow *Hirundo rustica* when hybridization between Cave and Barn Swallows was discovered in Texas (Brown and Brown 1996). The species was transferred back to original designation of *Petrochelidon* by AOU (1998) based on phylogenetics of the genus. Banks and Browning (1995) concluded that the name *pyrrhonota* has precedence over either *lunifrons* or *albifrons*. See Sheldon and Winkler (1993) for information on intergeneric phylogenetic relationships of Hirundininae based on DNA-DNA hybridization.



Five subspecies currently recognized, although only four are likely valid (*hypopolia* indistinct from *pyrrhonota*; Brown and Brown 1995). *P. p. pyrrhonota* is the most widespread, breeding in eastern North America west to the Rocky Mountains and southwestern British Columbia south to northwestern Baja California. *P. p. hypopolia* is the largest and most northerly subspecies, breeding from Alaska south to California and east to Wyoming. *P. p. ganieri* breeds from west-central Tennessee to central and south Texas. *P. p. melanogaster* breeds in southern Arizona and Mexico. *P. p. tachina* breeds from southwestern Utah, lower Colorado River valley to Baja California east to southwestern Texas (Brown and Brown 1995).

DESCRIPTION

Basic description: A swallow.

General description:

A stocky, square-tailed swallow with pale buff rump. Upperparts dull steel-blue, underparts buff-white, throat dark chestnut, pale gray nape, white or cream-colored triangular-shaped forehead patch. Two white streaks down the back. Males and females identical. Juveniles are brown above, buff below, and have varying numbers of small white spots on their foreheads and throats (Brown and Brown 1995).

Length (cm): 14

Weight (g): 28

Reproduction:

Breeding season is May to early August in the northeastern U.S.. Clutch size ranges from two to six (usually three to five). Incubation, by both parents, lasts about 12 to 14 days (Terres 1980). Young are tended by both parents; young fly between 21 and 23 days and may return to nest for the first two to three days after fledging. Parents continue to feed young before migration begins. One brood per season, although replacement broods may be produced if first clutch fails. Breeding activity within a colony is closely synchronized (Silver 1995). Sexually mature at one year (Brown and Brown 1995). See Brown and Brown (1988) for information on egg destruction by conspecifics.

Nests in colonies of up to 1,000 pairs (average is a few hundred). Pairs construct a gourd-shaped nest with a downward directed entrance tunnel using wet mud pellets collected nearby and molded to vertical surface, beginning where it meets horizontal overhang in close to a 90-degree angle (Emlen 1954, Brown and Brown 1995).

Ecology:

Gregarious during all seasons; highly colonial lifestyle has led to the evolution of complex social/behavioral traits including brood parasitism, sophisticated vocal system for identification of young, and observation of other colony residents to learn the locations of food (Brown and Brown 1995, 1996). During spring and summer, populations periodically experience dramatic declines due to reduced food availability as a result of prolonged cold spells (Bent 1942, Terres 1980, Brown and Brown 1995). Abundant parasitic swallow bug (*Oeciacus vicarius*) has reduced reproductive success in large colonies (Brown and Brown 1995).

Predators are primarily birds and snakes, including Sharp-shinned Hawk (*Accipiter striatus*), American Kestrel (*Falco sparverius*), Black-billed Magpie (*Pica pica*), Common Grackle (*Quiscalus quiscula*), Peregrine Falcon (*Falco peregrinus*), Acorn Woodpecker (*Melanerpes formicivorus*), bull snake (*Pituophis catenifer*) and rattlesnake (*Crotalus* sp.); also mink (*Mustela vison*) and some species of ants (Brown and Brown 1995). Introduced House Sparrow (*Passer domesticus*) usurps nests and destroys eggs and nestlings (Bent 1942, Samuel 1969, Brown and Brown 1995).

Migration:

Northward migration begins early February to April with arrival at breeding areas February to May. Arrives in California in February and March and in Alaska in May (Brown and Brown 1995). Fall migration departure variable; birds leave Alaska between July and early August, elsewhere in U.S. peak southward migration occurs in August and September (Kessel 1989, Brown and Brown 1995). Rare migrant in the West Indies (Raffaele 1983). Migrates through Costa Rica late August or early September to late October and early March to late May (Stiles and Skutch 1989). Uncommon and sporadic fall transient in Colombia, mainly early September to mid-October; fewer records of migrants in spring (April-May; Hilty and Brown 1986). Present in South America mainly between September and April (Ridgely and Tudor 1989). Usually seen migrating in groups of up to several hundred, occasionally several thousand; probably exclusively diurnal migrants, foraging as they move (Brown and Brown 1995).

Food:

Primarily insectivorous; consumes flying insects year round. Groups commonly feed on swarming insects. Feeds approximately 50 m above ground predominantly over open areas; also feeds over forests, canyons, and water (Brown and Brown 1995).

Phenology:

Diurnal.

Habitat:

Breeding habitat: Inhabits open to semi-wooded habitat, usually well below treeline in cliffs, canyons, farms, near meadows, marshes, and water. Builds bottle shaped mud nests in colonies on cliffs, eaves of buildings, under bridges, and similar sites, preferably with overhang. Has recently nested in artificial sites, likely a result of expanded range and increased abundance in the eastern U.S. and Canada (Erskine 1979, Brown and Brown 1996); use of natural nest sites is greatest in the west. Many birds return to same nesting area in successive years, but colonies often switch nesting sites between seasons, evidently due to a buildup of insect parasites in nests; commonly repairs and uses old nests.

Non-breeding habitat: Not well known; believed to inhabit lowland areas along the Rio Parana and Rio Uruguay and avoid the high Andes (Brown and Brown 1996).

STATUS

Global rank: G5 (2Dec1996)

Global rank reasons:

Secure – widespread and abundant.

State rank: S4B (15Jun2006)

State rank reasons:

Widely distributed in central Alaska; statewide breeding population estimated at greater than 1.8 million birds. Population has been declining over the past 25 years, although severity of the decline is not well-defined. Reasons for the negative trend in Alaska are unknown. Population is increasing across broader breeding range in North America. Threats are minimal and include nestling mortality from swallow bug infestations and adult mortality due to extremely cold weather conditions.

DISTRIBUTION AND ABUNDANCE

Range:

Global range:

Breeding: From western and central Alaska, northern Yukon, northern Mackenzie, Saskatchewan, northern Manitoba, Ontario, southern Quebec, New Brunswick, and Nova Scotia, south to Baja California and central Mexico, western Texas, Arkansas, Tennessee, western Virginia, southeastern Pennsylvania, western Connecticut and northeastern Massachusetts (Brown and Brown 1995). Range in the eastern U.S. and Canada is

currently expanding. Accidental records from coastal Siberia, southern Greenland, and the British Isles (Brown and Brown 1995).

Non-breeding: South America from southern Brazil and possibly southeastern Paraguay south to southcentral Argentina; several records as far south as Tierra del Fuego and Falkland Islands (Brown and Brown 1995). Occasionally north at least to Costa Rica.

State range:

Breeding: Common in central Alaska in the Yukon, Kuskokwim, Susitna and Copper River drainages and near Fairbanks (Gabrielson and Lincoln 1959, Kessel and Gibson 1978). A rare breeder along the Alaska North Slope in mountainous regions, and casual visitor to the Beaufort Sea coast (Kessel and Gibson 1978, Johnson and Herter 1989) and Seward Peninsula; rarely in southeastern Alaska near the mouth of the Stikine River (Hamilton 1948, Kessel and Gibson 1978).

Abundance:

Global abundance:

Global population estimate is 89,000,000 birds (Rich et al. 2004). Breeding population is difficult to census accurately by transect methods because species concentrates in colony areas which may be occupied erratically from year to year. North American Breeding Bird Survey (BBS) estimates a relative abundance of 16.99 birds/survey route (n = 2066) from 1966 to 2004 throughout the North American survey area (Sauer et al. 2005a).

State abundance:

Statewide population estimate 1,800,000 (2% of global population; Rosenberg 2004 a, Rosenberg 2004b). Relative abundance estimated at 3.15 birds/survey route (n=30) in Alaska BBS data, 1980 to 2005 (Sauer et al. 2005a).

Trends:

Global trend:

BBS data indicate significant population increases throughout North America in the last four decades (Sauer et al. 2005a,b). Between 1980 and 2005 a positive trend of 0.4%/year ($P < 0.38$, n=1930) was observed survey-wide (Sauer et al. 2005a). However, even statistically significant trends in BBS data should be interpreted with caution because erratic abandonment/colonization of nesting sites along survey routes may bias abundance and trend estimates (Brown and Brown 1995). Numbers have increased in some areas and range has expanded into southeastern U.S. due to availability of new sites for nesting (such as dams, highways, bridges; Brown and Brown 1996). Stable or increasing throughout the range, except in some northeastern states (e.g., Massachusetts, New Hampshire; Silver 1995, Sauer et al. 2005a,b).

State trend:

Apparently declining, but the severity of the decline is not well defined. Alaska BBS data for the period from 1980 to 2004 indicate a nonsignificant decline of 4.8%/year ($P < 0.21$, n = 30; Sauer et al. 2005b), while BBS data for the period from 1980 to 2005 indicate a downward trend of only 0.9% year ($P < 0.75$, n=30, Sauer et al. 2005a). The addition of

only one year's worth of data resulted in a 3.8% reduction in the annual rate of decline. Brown and Brown (1995) suggest that even statistically significant trends in BBS data for this species should be interpreted with caution because erratic abandonment/colonization of nesting sites along survey routes may bias abundance and trend estimates.

EXISTING PROTECTION

Global protection:

Protected under the Migratory Birds Treaty Act of 1918 and under some state regulations; it is illegal for any person to take, possess, transport, sell or purchase swallows or their parts, such as feathers, nests or eggs, without a permit. A permit may or may not be required to remove unoccupied or occupied nests, and nest exclusion is generally allowed without a permit (Gorenzel and Salmon 1994).

State protection:

See Global protection comments.

CHALLENGES

Global challenges:

In the northeastern U.S., threats include poor adhesion of nests to nest surfaces, competition with House Sparrows for nesting sites, and possibly a decrease in the amount of agricultural and open land, which may result in fewer mud sources for nest building (Silver 1995). Nestling mortality from swallow bug infestations may be considerable in some large colonies, especially for late-starting nests or colonies (Brown and Brown 1995, 1996). Infestations of swallow bugs and mites reduce nestling growth rates and can result in death of up to half of all nestlings (Gorenzel and Salmon 1994). Sensitive to cold and dependent on active flying insects for food; weather-related starvation is likely the most important cause of adult mortality during the breeding season (Bent 1942, Brown and Brown 1995). Sometimes considered a nuisance because they nest in colonies on buildings and other structures; pest management control programs that target this species aim to prevent or stop nesting on buildings by blocking vertical surfaces with netting, wire or other deterrents; occasionally vertical surfaces are covered with toxic or sticky substances as deterrents, which reduces nesting habitat (Gorenzel and Salmon 1994).

State challenges:

Nestling mortality from swallow bug infestations may be considerable in some large colonies, especially for late-starting nests or colonies (Brown and Brown 1995, 1996). Infestations of swallow bugs and mites reduce nestling growth rates and can cause up to half of all nestling death (Gorenzel and Salmon 1994). Weather related starvation is likely the most important cause of adult mortality during the breeding season (Bent 1942, Brown and Brown 1995). Species is sensitive to cold and dependent on active flying insects for food; when late spring cold snaps last at least four days, mortality due to starvation may be substantial.

RESEARCH AND INVENTORY NEEDS

Global research needs:

Research has focused on nominate race, *H. p. pyrrhonta*; southwestern and Mexican birds (Subspecies *tachina* and *melanogaster*) are poorly studied; substantial variation among populations in social behavior and life history are suspected (Brown and Brown 1995). Range and behavior during migration and winter are poorly known. A better understanding of habitat requirements and identification of key habitats throughout range are needed.

State research needs:

Assess the severity of the observed decline and determine factors that may be contributing to it. Conduct research and/or analyses of existing data to identify key habitats, habitat attributes, and local areas that support high densities of this species during breeding and migration. Determine if declines in habitat are linked to population declines (ADFG 2005).

Global inventory needs:

Continue participation in the BBS and other monitoring surveys.

State inventory needs:

Maintain current participation in the BBS. However, the BBS may not adequately sample this species because of erratic abandonment and colonization behavior; develop protocols that account for these variables. Examine independent data on trends from migration stations, other breeding surveys such as the Off-road Breeding Bird Survey, and demographic monitoring to determine if declines are evident in areas not sampled in the traditional breeding bird survey (ADFG 2005). Cliff swallows breeding in the Askinuk Mountains in western Alaska represent a relatively isolated population at the northwestern extent of their breeding range. Determine whether these birds are expanding and establishing new territories (Gerhardt 1990).

CONSERVATION AND MANAGEMENT NEEDS

Global conservation and management needs:

House Sparrow control methods may benefit Cliff Swallows, especially in the eastern U.S. and Canada. In North Dakota, large population increases occurred after House Sparrows were removed (Krapu 1986). In Massachusetts, breeding population increased with removal of House Sparrows, installation of nest ledges, and provision of an appropriate mud supply (Silver 1995). Maintain rigorous permitting system (e.g., similar to that in California) for nest removal; develop and distribute information to the general public about non-lethal exclusionary measures (Gorenzel and Salmon 1994).

State conservation and management needs:

Develop map of known breeding areas and identify important habitats. Conservation and management efforts should continue to focus on monitoring abundance and trends and determination of breeding habitat requirements.

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