

Sacramento Purple Martins in 2015: When a Population Increase May be Misleading

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We report on the status of the western Purple Martin (*Progne subis aboricola*) nesting population in the Sacramento area in 2015. This population is the last sizable nesting population in California's Central Valley, where it was once widespread (Airola and Williams 2008). The species is designated as a Species of Special Concern by the California Department of Fish and Wildlife due to substantial reductions in the species' geographic range and numbers (Airola and Williams 2008).

We previously reported a consistent decline in the Sacramento Purple Martin nesting population from 2005 through 2014, and the 2013-14 decimation of a major colony by American Kestrel (*Falco sparverius*) predation (Airola et al. 2014). We report here on the nesting status in 2015 and report on a new threat to the largest remaining nesting colony.

STUDY AREA AND METHODS

As annually since 2002, we surveyed for nesting Purple Martins at bridges in the Sacramento area that were occupied or suitable for use by the species. Because the number of colonies and size of this population has declined so much, and no new colonies have been formed in recent years (Airola et al. 2014), we focused 2015 surveys only on sites where martins have nested over the last decade, and did not survey suitable sites that have not been previously occupied. Colony locations and the criteria used to define them, were described by Airola and Grantham (2003) and Leeman et al. (2003).

As in previous years, we conducted at least 10 visits to each colony to map "weep" holes in bridges that martins used and recorded diagnostic breeding behaviors (i.e., carrying food to nests, removing fecal sacs, begging by nestlings, and nestlings perched at hole entrances; Airola and Grantham 2003). These methods provide a consistent and repeatable way to enumerate the nesting population. We confirmed diagnostic breeding behaviors for all but one of the pairs counted in 2015. The one pair not confirmed breeding by behavior was designated as nesting based on the number and duration of nest visitation—it likely failed during the incubation stage.

RESULTS AND DISCUSSION

Nesting Population Status and Colony Occupancy

A total of 36 pairs nested at Sacramento colonies in 2015 representing a 20% increase in the breeding population in 2014. Overall, the martin nesting population in Sacramento has declined by 79% from its high of 173 pairs in 2004 (Figure 1).

Purple Martins nested at only four sites in Sacramento during 2015 (Table 1), a decline by two colony sites (33%) from the number in 2014. The 2015 number is the lowest number of colonies occupied since systematic monitoring of the population began in 2002 (Figure 1). Only one-third of the 12 colonies present in 2005 remained active in 2015.

The two colonies that disappeared in 2015, 35th St. and Sutterville, had each hosted a single nesting pair in 2014 (Table 1), and had been identified as likely to disappear (Airola et al. 2014). Both colonies were very healthy at one time. The 35th St. colony supported 29 pairs in 2002, but it declined to 3 pairs by 2007 and remained at 1 to 3 pairs until use ended in 2015. Sutterville had been one of the largest colonies during 2011-2013 with 10 pairs each year, but was recently disrupted by predation from American Kestrels that began at the end of 2013 (Airola and Kopp 2013, Airola et al. 2014). The nesting population there crashed to a single pair in 2014 and then disappeared in 2015. A minor decline occurred at one other colony, but numbers increased at three others (Table 1).

Superficially, the increase in the nesting population would seem to be good news after many years of declines. But the likely explanation for the increase is less encouraging. The 2014 nesting population was the lowest ever recorded and represented the single greatest decrease in numbers from the previous year. The decrease in pairs that nested (and therefore that we counted) in 2014 was strongly influenced by kestrel predation at the Sutterville colony. The number of breeding pairs there dropped from 10 in 2013 to 1 in 2014 (Table 1). A larger number of birds arrived at the colony in 2014 and appeared to be initiating breeding but then, under attack from the kestrels, did not proceed to nest or abandoned early in the nesting period (Airola et al. 2014). Therefore these birds were not counted as breeding pairs.

We were uncertain if the reduction in breeding pairs in 2014 at Sutterville occurred because they were preyed upon or just dispersed from the site after their breeding was disrupted by the kestrels. The Sutterville birds apparently did not disperse to other breeding sites and attempt to breed there in 2014, because no increases in numbers were recorded at those sites.

The 2015 results suggest a high proportion of the adult Sutterville birds likely survived the 2014 predation at Sutterville and relocated to breed at other colonies in 2015. Numbers of pairs at the two closest colonies to Sutterville (I St. and S St.) increased by 57% and 50% respectively (Table 1).

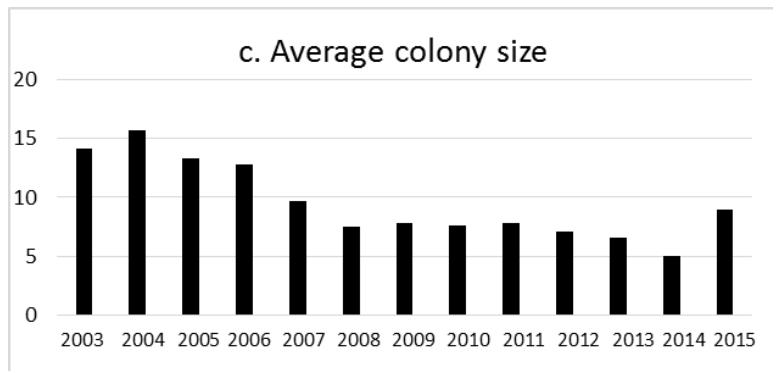
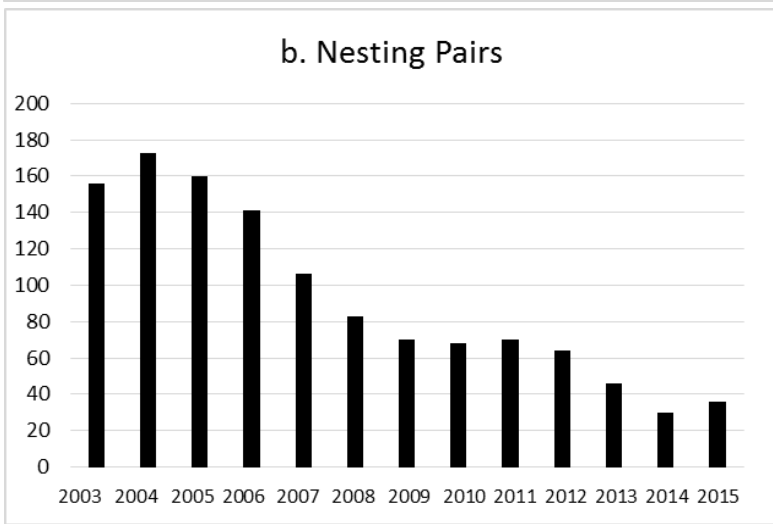
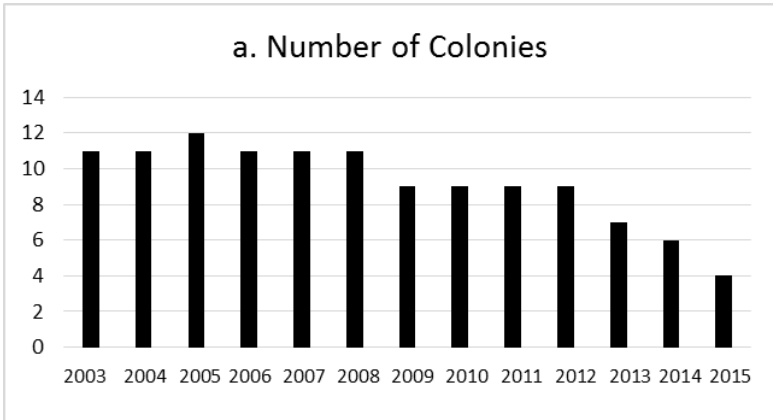


Figure 1. Changes in a) number of Purple Martin nesting colonies, b) nesting population size, and c) average number of nesting pairs per colony in Sacramento, 2003-2015.

Therefore, while our count of pairs that bred in 2014 was correct, it did not reflect the likely occurrence of a higher than normal number of non-breeding adults that year. By breeding elsewhere in 2015, those adults elevated the population of breeding pairs, creating an appearance of an increase in the Sacramento Purple Martin population.

This 2013-2015 situation illustrates the difference between the breeding population, as we record them, and the actual population of breeding age individuals. In most years, most adults are presumed to breed and there is little difference in the two measures. The increase in the 2015 breeding population suggests the total adult population in 2014 was higher than the 30 breeding pairs we recorded. Unfortunately, it does not suggest the Sacramento Purple Martin population recovered in 2015. This is further illustrated by the fact the decline over the two year period from 2013-2015 was 22% (11% per year), which is only slightly below the 15% average annual rate of decline since 2004.

The average size of the 4 colonies occupied in 2015 increased substantially, from an average of 5 pairs to 9 pairs (Figure 1). This result, however, appears to be an artifact of the loss of two small colonies and the relocation of birds from Sutterville to other colonies. Therefore, it does not suggest any population recovery.

Kestrel Predation Effects in 2015

American Kestrels were present at the Sutterville colony early in the nesting season in 2015. We observed no martins at this colony during many visits over the course of the nesting season.

Kestrels were seen periodically at the Redding Ave. colony throughout the Purple Martin nesting season. Most kestrel activity, however, was associated with a large open area 1.1 km east of the colony site. Kestrels were seen entering weep holes on the underside of the Redding Ave. overpass only a few times during 2015. Such low use was in contrast to 2013 and part of the 2014 nesting season, when kestrels regularly were observed taking swifts from and hunting martins at bridge nest sites (Airola and Kopp 2013, Airola et al. 2014).

While kestrel predation did not appear to directly affect the Purple Martin nesting population in 2015, past predation may have contributed to the decline between 2013 and 2015. Although direct predation on adults may have been limited in 2014, as inferred from the increase in the nesting population in 2015, it almost surely prevented the 6+ pairs that initially showed up at Sutterville from breeding successfully in 2014 (Airola et al. 2014), and thereby reduced recruitment of new adults to the population.

Table 1. Number of breeding pairs of Purple Martins in the Sacramento region, California, 2002–2015

Colony	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
I Street	37	29	35	32	17	11	6	5	4	5	7	5	7	11
20 th Street	14	21	23	23	16	15	6	5	1	3	2			
Sutterville	4	6	8	5	6	6	5	6	8	10	10	10	1	
Broadway	8	7	7	7	5	1	1							
S Street	14	14	16	14	18	9	7	6	7	7	7	3	4	6
35 th Street	29	19	15	14	6	3	3	1	2	3	1	2	1	
Redding Ave.		3	12	10	14	14	15	17	16	20	20	13	10	9
Arden	ns ^a		3	6	13	9	11	12	9	3				
El Camino	ns	15	23	21	21	20	11	5	10	7	7	3	3	
Marconi	ns	1	4	3										
Roseville Rd.	29	39	27	24	24	17	17	13	11	12	9	10	7	10
Airbase	ns			1	1									
Hwy. 65/Taylor	ns	ns	ns	ns	ns	1	1				1			
Pole Line	ns	2									0			
Total	135	156	173	160	141	106	83	70	68	70	64	46	30	36

^ans=not surveyed

New Population Threat: I St Bridge Replacement

Yet another major threat to the Sacramento Purple Martin population surfaced in 2015. The City of Sacramento is proposing to relocate the I St Bridge to an area 500 m north of the existing I St Purple Martin nesting colony (City of Sacramento Planning Department 2015). The project would remove the existing I St bridge approach ramp where the martins currently breed. Additional weep holes that were formerly used for nesting by martins in Interstate 5 adjacent to the existing I St Bridge would remain available. The City also is contemplating using a hollow box girder design for the new bridge, which would provide weep hole entrances to nesting chambers similar to the existing nesting site.

While suitable habitat would remain after removal of the approach, some of which was previously used by martins, we do not support the removal of the bridge. The I St. colony site now supports the largest Purple Martin nesting colony in the Central Valley, where the species is obviously highly imperiled. The site is the easiest martin colony site to manage due to ownership and substantial support provided by California Department of Parks and Recreation and California State Railroad Museum. For example, the site is the only martin colony where all occupied nest sites have wire “nest guards” (Airola and Grantham 2003) installed to reduce fallouts by nestlings.

We have suggested the bridge approach be left in place, as martin nesting habitat and for the shade and protection it provides to the parking lot for the California State Railroad Museum. To date, the City has shown no receptivity to this idea, and in its public involvement materials has not acknowledged the issue (City of Sacramento Planning Department 2015) despite it being discussed on several occasions with the City’s Project Manager and its environmental consultant. Alternating the direction of the bridge project would likely take concerted effort by conservation groups and individuals. We believe such an effort is warranted.

None of the 2015 results give us reason for any hope of recovery of the Sacramento Purple Martin population. If suspicions are correct that large recent increases in use of pyrethroid and neonicotinoid insecticides are causing the martin population to collapse (Airola et al. 2014, B Cousens unpub. data), no solution is likely to be found before the Sacramento martin population disappears. Proponents of land uses that have potential to harm martin populations may use the insecticide threat to argue that protecting martin nesting habitat is biologically meaningless. Our response is that we should work to prevent all the possible detrimental effects, and hope that somehow the martin population is able to make it through to the future.

ACKNOWLEDGMENTS

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NOTE RE JOHN LOCKHART:

As most of you know by now John Lockhart of Visalia passed away very unexpectedly at home on Dec. 8. He will be, and already is, greatly missed. He was the eBird reviewer for Tulare-Kings counties, co-owner of the Tulare-Kings Listserv, overseer & keeper of the Tulare Co. bird list, organizer of local CBCs, active in Tulare Audubon and one of the few very active Tulare-Kings Co. birders. To honor John, his contribution to southern Central Valley birding, and generous spirit, a scholarship fund for youth birding has been set up in John's name through the Central Valley Bird Club (CVBC).

Please join us if you can by sending your tax deductible contribution to:

CVBC; c/o Frances Oliver; 1817 Songbird Pl; Lodi, Ca 95240

Attn: John Lockhart Memorial Fund

Susan Steele, Inyokern & Steve Summers, Porterville