



Maintaining Purple Martins' Majesty

AS THEIR NUMBERS DECLINE, THEIR SURVIVAL RELIES ON HUMANS CONTINUING TO PROVIDE HOUSING

By James D. Ray, Blake A. Grisham, and Joe Siegrist



Aerial insectivores are among the most recognizable and endearing groups of birds in the world. They're known for their dazzling, unpredictable flight, their chirps and buzzes and their large nest colonies. Yet many are experiencing long-term population declines, including purple martins (*Progne subis*) (Sauer et al. 2017), whose beautiful plumage, large size and loud songs make them easy to distinguish.

These declines are especially apparent among the eastern subspecies (*P. s. subis*), even along the Gulf Coast where they have been the most abundant and stable (Tautin et al. 2009, Ray 2015, Sauer et al. 2017). The eastern purple martin, whose range extends east of the Rocky Mountains from southern Canada to northern Mexico, has undergone a nearly complete shift in nesting tradition. These birds are highly affiliated with human activities. Now humans have become critical in providing the nesting sites they need to persist.

While purple martins once nested in cavities in trees, between boulders and other spots, today, they almost exclusively nest colonially in multi-compartment birdhouses and gourd clusters, and the shift may be permanent. How did this happen? Theories generally focus on cavity availability, safety from predators afforded by nesting in association with human settlements and the increased opportunity for extra-pair copulations in situations where nests are more closely situated.

The transition started well before European settlers arrived. At least seven Native American tribes are known to have hosted aggregations of this bird in clusters of hollow gourds. Although it is unknown when this tradition started, remains of bottle/birdhouse gourds in Florida date back 10,000 years (Kistler et al. 2014). When colonists arrived, eastern purple martins found abundant niches and cavities suitable for nesting in their homes and buildings. That changed when the introduced house sparrow (*Passer domesticus*) arrived in

◀ The persistence of eastern purple martins will likely rely on human-provided nesting sites. Credit: Danny Hancock



1851 and the European starling (*Sturnus vulgaris*) appeared in 1890, usurping their cavities and lowering their productivity.

Purple martins found provisioned multi-compartment birdhouses to their liking, though. By 1900, most eastern purple martin nesting occurred in provisioned housing (Brown and Tarof 2013), where human “landlords” managed the housing by excluding sparrows and starlings. As these exotics increased and spread, martin house designs evolved, incorporating vertically raising and lowering capability, accessible compartments and various entrance hole and trap designs. While house sparrow and European starling populations are also entrenched in long-term declines, their numbers remain several orders of magnitude higher than the purple martin’s (Sauer et al. 2017), and they are extremely persistent when claiming cavities for nesting.

The eastern subspecies’ need for active management is now apparent, yet because it appears to be abundant in backyard birdhouses, conservation action has been slow. Its dependence on manmade cavities and management raises two important questions. How productive are purple martins in human-provisioned bird housing? And are we still providing the housing they have come to rely on?

Helpful ‘landlords’

The Purple Martin Conservation Association maintains *Project Martinwatch*, a citizen scientist program dedicated to conserving and managing purple martins by providing managed housing. The program maintains a long-term database from “landlords” who monitor and care for the birds in housing they provide. The database includes over 20 years of demographic data collected across the eastern United States and Canada.

The data are maintained and quality controlled by professional biologists, and they are updated yearly as landlords collect more nesting information. In 2014, researchers compiled more than 73,000 nest records from this database and included them as a final project in a graduate-level population modeling class at Texas Tech University. Students spent the semester editing the database to make



Credit: Michael Cario/U.S. Fish and Wildlife Service

the records consistent with input files for Program MARK. After six months of entering the data manually, the project resulted in about 72,000 rows of data — including geographic region, housing type and entrance hole type, as well as demographic data including age of parents, number of eggs and abiotic data including various weather inputs — ready to help assess nest survival across the eastern subspecies’ range.

The result was a peer-reviewed manuscript published in the *Wildlife Society Bulletin* in 2019. The paper, “Nest Survival Data Confirms Managed Housing is an Important Component to the Conservation of the Eastern Purple Martin” (Raleigh et al. 2019), indicated nest survival — from egg laying to hatch and from hatch to fledging — exceeded 80% across the 19-year dataset.

The paper answered our question about productivity in human-provided housing. The data were clear. Uncertainty was small. The eastern purple martin is highly productive in managed housing. The data even suggested that landlords were free to choose the housing type that fit their budget and taste, as long as they keep out starlings and sparrows and follow the Purple Martin Conservation Association’s placement guidelines.

A housing shortage?

Our second question — are humans still providing housing — remains, but there is reason for concern. A recent publication in *Conservation and Society* suggested most people who care for purple martins are older, white, southern men (Jervis et al. 2019). Preliminary data from the PMCA corroborate these

▲ Purple martins almost exclusively nest colonially in multi-compartment birdhouses and gourd clusters, like these at Prime Hook National Wildlife Refuge in Delaware.



► Madeline Thornley, a recent graduate of Texas Tech University and the 2019 wildlife biology summer intern for Consolidated Nuclear Security, LLC, the managing and operating contractor at the USDOE-NNSA Pantex Plant, gained experience banding and attaching data-loggers to adult purple martins at a study site in the Texas Panhandle and a greater appreciation of the declining insectivore.



Credit: Blake Grisham

data. Three-quarters of landlords surveyed fit that demographic. Among the 66 landlords included in purple martin banding studies conducted by Ray (2012) between 1997 and 2012, 58 were over 50 years old — almost 88 percent of them — and there was little evidence of new recruitment.

Combined, these data highlight an important need for purple martins, as well as other declining aerial insectivores. Active management, including

education and outreach to other demographics, is important for long-term conservation and population persistence.

It is unlikely that the eastern purple martin will return to natural cavities — although it will occasionally nest in unconventional manmade spots, like openings in traffic signals and streetlights, broken roof tiles and under picnic area canopies. Even nesting in these situations tends to be short-lived, though. European starlings and house sparrows outcompete for them (Ray and Beauprez 2018), and eventually, broken structures are repaired or replaced.

Even though the causes of this endearing species' declines are becoming apparent, we know it experiences extremely high nest success in human-provisioned housing. It must be placed to certain specifications, though. It must be plentiful. And landlords must remain vigilant in managing against starlings and sparrows.

We task our discipline to promote the interest of future generations in hosting a colony of these wonderful birds. Below we highlight a few recommendations on how to accomplish engagement as well as provide an example of success from the PMCA.

► The Texas Tech Student Chapter of The Wildlife Society recently established a colony of artificial gourds on the Texas Tech University Native Rangeland.



Credit: Blake Grisham



Purple martin ambassadors

The easiest way to engage audiences in conserving purple martins is to expose them to the species. The absolute best ambassadors are active martin colonies and the landlords who host them. With a minimum of effort, they can expose relatives, friends and neighbors to the species, its management needs and the day-to-day efforts needed to result in the high nest survival rates observed in [Raleigh et al. \(2019\)](#).

For an even more involved approach, landlords could host field days, give community presentations and reach out to the media. Opportunities at schools, zoos and parks hold obvious potential for reaching youth. Working with community groups to establish new colonies in public areas and on private lands has extremely high conservation benefits, as long as the colonies are managed over the long term.

Professional working groups have emerged in some northern areas, including the New England Purple Martin Working Group and Minnesota Purple Martin Working Group ([Tautin et al. 2009](#)), where the steepest declines have occurred. Proactive education measures will likely become more important considering current purple martin population trends and human demographic data ([Tautin et al. 2009](#)). Purple martins are noncontroversial, have direct human benefits and are aesthetically pleasing. Given that conservation actions are inexpensive and logistically easy, they should be considered an easy conservation target for management agencies.

There are good examples of organizations reaching out to the public to increase awareness. Texas Tech's Natural Resources Management Department is attempting to attract a purple martin colony for a legacy project where students through the years can participate in monitoring, management and research. Employees of the U. S. Department of Energy-National Nuclear Security Administration's Pantex Plant mentored the Amarillo Zoo in north Texas through the process of selecting and placing purple martin housing — which was occupied the following nesting season. Pantex staff invite kids attending camp at the zoo to watch them band nestlings, and they invite neighborhood kids to participate in banding and attaching data-loggers. Over the past five years, over 50 university students have gained experience attaching data-loggers. Since 1997, more than 40 colonies in two states have been

involved in a nestling banding program, with each banding session considered an outreach opportunity. The number of nestling purple martins banded by Pantex staff now exceeds 12,000.

A new generation of landlords

The [Purple Martin Conservation Association's](#) mandate is the continued inspiration of new generations of environmentalists to install artificial housing, ensuring the continuation of the eastern subspecies, which comprises about 98% of the entire population. The PMCA strives to make the public aware of

▼ Purple martin hatchlings appear in human-provided housing. Research has shown that nest survival is high as long as "landlords" follow basic guidelines.



Credit: Consolidated Nuclear Security, LLC

the species' conservation concerns and encourages people to establish and manage a martin colony on their property. For existing landlords, it offers best management practices developed through years of scientific research.

Research by the PMCA has shown that early exposure is an excellent indicator of future interest in purple martin conservation. As such, targeting students and young adults is a primary outreach goal. The organization certainly uses traditional outreach methods, but to reach this younger audience, it leans on social media and online multimedia outlets.

The best ambassador for purple martins, however, is an active colony. The PMCA is constantly looking for parks, schools and other public institutions to establish thriving purple martin colonies to inspire



future martin landlords. It is developing a curriculum to ease the integration of a martin colony into the classroom. The eventual goal is to provide any school interested in maintaining a colony with the lessons and equipment necessary to make martins a valuable addition to the educational process across the species' range.

Along with other insectivores, the purple martin plays a vital role in the delicate balance of ecosystems across the U.S. and parts of Canada. The eastern subspecies — once widely acclaimed as America's favorite bird — has a long history of association and endearment to humans. Its dependence on humans is unique, and it provides people an opportunity to participate in and appreciate wildlife management, regardless of whether they live in a rural or urban setting.

Providing properly designed, placed and managed housing has proven to produce high rates of nesting success. Now is the time to do all we can to promote the management needs of this wonderful bird. Although researchers are still searching for causes of its declines in areas of the east, assuring abundant and safe nesting sites is critical to its long-term persistence. ■

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