



BULLETIN

OF THE

TEXAS ORNITHOLOGICAL SOCIETY

Vol. 48 No. 1–2 December 2015



**Published by the
Texas Ornithological Society
www.texasbirds.org**

THE STATUS OF THE PURPLE MARTIN IN TEXAS

James D. Ray^{1,2}

Purple Martin Conservation Association, Erie, Pennsylvania, 16505 USA

The Purple Martin (*Progne subis*) is an obligate aerial insectivore found across much of North America (Tarof and Brown 2013). In Texas it is found in much of the state except for extreme western areas of the Panhandle and South Plains and most of the Trans Pecos (Ray 1995, 2001; Seyffert 2001; Figure 1, Sauer et al. 2014). All Purple Martins in Texas belong to the subspecies, *P. s. subis*, which in the United States and Canada occurs west of the Rocky Mountains and is now dependent on man for provisioned nesting cavities (Bent 1942; Hill 1988, Tarof and Brown 2013) that are managed to exclude the House Sparrow (*Passer domesticus*) and European Starling (*Sturnus vulgaris*; Tarof and Brown 2013; JDR unpubl. data). Management includes the use of starling-resistant entrance holes

(Chambers 1994, Kostka 2001), nest tear-outs, and trapping and lethal control of the two exotic species (Ray 2012a, JDR unpubl. data).

Aerial insectivore populations have declined since the mid-1980s at a rate significantly higher than other passerine birds (Nebel et al. 2010). The taxonomic breadth of declining species suggests that downward trends involve changes to insect populations, and long-distance migrants such as the Purple Martin seem particularly affected (Nebel et al. 2010). The northeastern region of the Eastern race's range receives relatively high levels of acid rain and other airborne pollutants, which have negative effects on insect abundance and in turn the productivity of aerial insectivores (Nebel et al. 2010). There may also be a developing mismatch

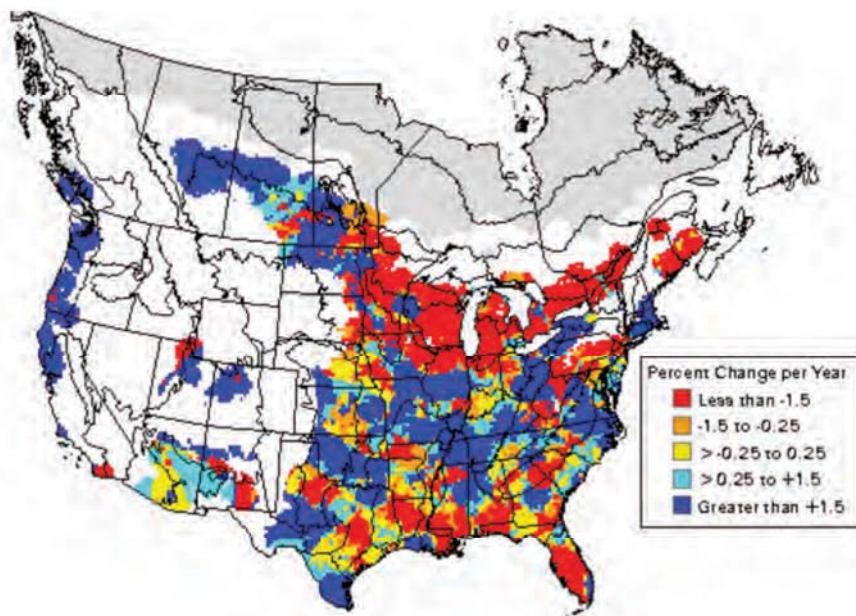


Figure 1. Mean percent change per year for Purple Martin, 1966-2014 (from Sauer pers. comm.).

¹E-mail: Corresponding author: bnbman@suddenlink.net

²Current address: 8500 Kemper Road, Canyon, TX 79015

between spring arrival dates and insect availability due to climate change (Fraser et al. 2013). Effects of neonicotinoids insecticides are of concern, having been linked to declines of insectivorous birds in Europe (Hallmann et al. 2014).

Purple Martin populations are declining across their range (1966-2014; $-1.1\% \text{ yr}^{-1}$ [$-4.3, -0.6$]; Sauer pers. comm.) and states along the Gulf Coast of the United States are among those of particular concern (Tautin et al 2009). Purple Martins may be particularly affected by changing human age and ethnic demographics. Artificial housing, including provision and management, is mainly provided by older generations (Ray 2012b). Similarly, the more recent generations and ethnic composition (Lopez 2005) may have a decreasing interest in natural resources management. Thus, regular monitoring of Purple Martins is warranted. Status of Purple Martin populations in Texas was last assessed by Ray (2001) as part of the Texas Breeding Bird Atlas Project (Benson and Arnold 2001). Herein, my objective was to summarize the current distribution and status of the Purple Martin in Texas.

METHODS

I used analyses and maps of the U. S. Geological Survey's Breeding Bird Survey (BBS) to describe the current distribution (Sauer pers. comm. [for 2014 results not posted on the website as of yet]) and population status (Sauer et al. 2014) of the Purple Martin in Texas. For comparative purposes I used the BBS search feature and obtained trend estimates for the Purple Martin on the range-wide level, from surrounding states, and in states and regions where I found that declines are occurring. I also accessed range-wide maps of percent population change (1966-2014; Sauer pers. comm.) and relative abundance (2007-2013; Sauer et al. 2014) from the latest analyses of BBS data. The BBS uses a hierarchical model for trend analyses (Sauer and Link 2011; Sauer et al. 2014), where significance is possible when the credible interval (2.5% and 97.5% percentiles of the posterior distribution of trend estimates) does not contain zero (0).

Because the BBS may not detect Purple Martins in areas with low densities, I augmented BBS data with distribution information from Ray (1995, 2012a) and Seyffert (2001) for the Panhandle, and searched the Internet for evidence of nesting

of Purple Martins in the Trans Pecos and adjacent eastern New Mexico (searched for 'Trans Pecos Purple Martins', 'West Texas Purple Martins', 'Guadalupe Mountains Purple Martins,' 'Purple Martins southeast New Mexico,' 'e-bird Purple Martins.')

RESULTS AND DISCUSSION

The highest relative abundances of Purple Martins indicated by BBS were in North Texas, the mid- and upper Coastal Plain, and the western and central portions of East Texas (10-30 birds observed per route; Figure 2, Sauer et al. 2014). The densities of Purple Martins east of the 100th Meridian (1-100/ BBS route) are similar to those observed over much of the southern U. S. and northeasterly from Texas through the eastern portions of the Midwest.

BBS data indicate that the Purple Martin nests across all of Texas except for west of a line from the northeast corner of the Panhandle, southwesterly to approximately Lubbock (Lubbock County), Monahans (Ward County), and to west of Fort Stockton (Pecos and Brewster Counties; Figure 1, Sauer et al. 2014). Ray (1995) and Seyffert (2001) confirm Purple Martins nesting further west in the Panhandle to Spearman (Hansford County), Amarillo (Potter and Randall Counties), and Canyon (Randall County). The lack of BBS lines within communities (Ray 1995) and low densities contribute to the lack of detection of Purple Martins upon the High Plains of the Panhandle. The only change from Ray (2001) is that BBS data indicates that Purple Martins inhabit Brewster County in the Trans Pecos (BBS; Sauer et al. 2014).

Colonies in artificial housing in southeastern New Mexico (Lord and Lord 2010) are testimony that Purple Martins could eventually be encountered even in western portions of the South Plains. Additionally, the proximity of the Purple Martins in the mountains of New Mexico adjacent to El Paso, Hudspeth and Culberson counties of the Trans Pecos is intriguing (Figure 1 and 2). Any natural cavity-nesting Purple Martins in western mountains would likely be of the subspecies *P. s. arboricola* (Behle 1968; Baker et al. 2008; Tarof and Brown 2013). Any finding of Purple Martins breeding in natural cavities (cliff faces, snags, live cottonwoods and oaks; [Tarof and Brown 2013; Ray 1999]) there, or anywhere in Texas would be noteworthy. While Strecker (1912) stated that the

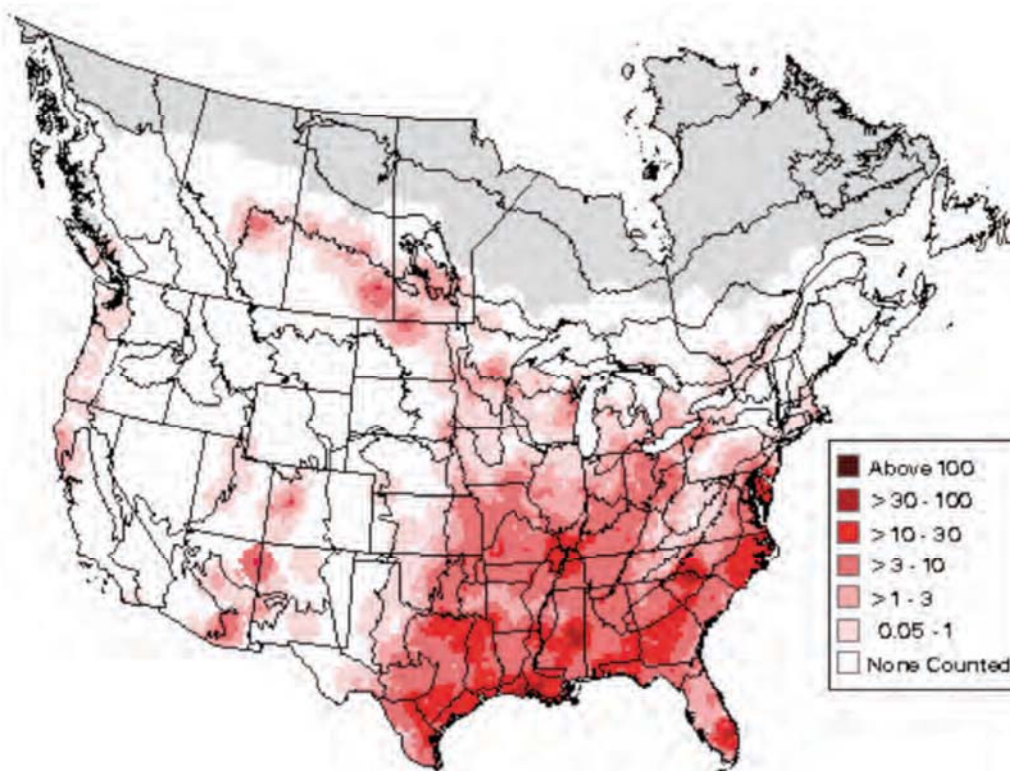


Figure 2. Relative abundance for Purple Martin, 2007-2013 (from Sauer et al. 2014).

Purple Martin occurred statewide, it is unclear if his definition of “inhabitants” included migrants. Peterson and Zimmer (1998) refer to the Purple Martin as a casual migrant in the El Paso area and that specimens exist for Big Bend National Park and the Davis Mountains. A bird list for Guadalupe Mountains National Park lists the Purple Martin as accidental in occurrence (Carlsbad Caverns Guadalupe Mountains Association 1997).

Concern is rising over the significant and long-term population trend of the Purple Martin in North America (Tautin et al. 2009, Fraser 2012). The species is in a range-wide decline (1966-2014) across 20 states and Canadian provinces (Sauer pers. comm.). Of particular concern are populations in the Great Lakes states and provinces, New England states, Maritime provinces, and in states along the Gulf of Mexico. A dozen states and provinces concentrated in the Northeast and along the Pacific Coast have applied such designations as

“threatened” or “special concern” to Purple Martins (Tautin et al. 2009).

Louisiana (-2.0 yr^{-1} [$-2.9, -1.0$]), Alabama (-2.7 yr^{-1} [$-3.6, -2.0$]), and Florida (-2.4 yr^{-1} [$-3.6, -1.2$]) are experiencing significant long-term population declines. Georgia (-0.3 yr^{-1} [$-1.2, 0.5$]) and Mississippi (-0.7 yr^{-1} [$-1.8, 0.5$]) are declining, but not at levels of significance (Sauer pers. comm.). In Texas, populations of the Purple Martin remain stable (1966-2014; $0.4\% \text{ yr}^{-1}$ [$-0.4, 1.1$]), if they are not increasing (non-significant). However, Purple Martins in much of East, Central and North Texas appear to be declining similarly to populations in the other Gulf Coast states (red and orange colors in Figure 1; -0.25 to $-1.5\% \text{ yr}^{-1}$). When compared to a map covering a period prior to the Texas Breeding Bird Survey project (1966-1996; U. S. G. S. Breeding Bird Survey 1996.), it is clear that these areas of concern have expanded (Figure 1 and Figure 3).

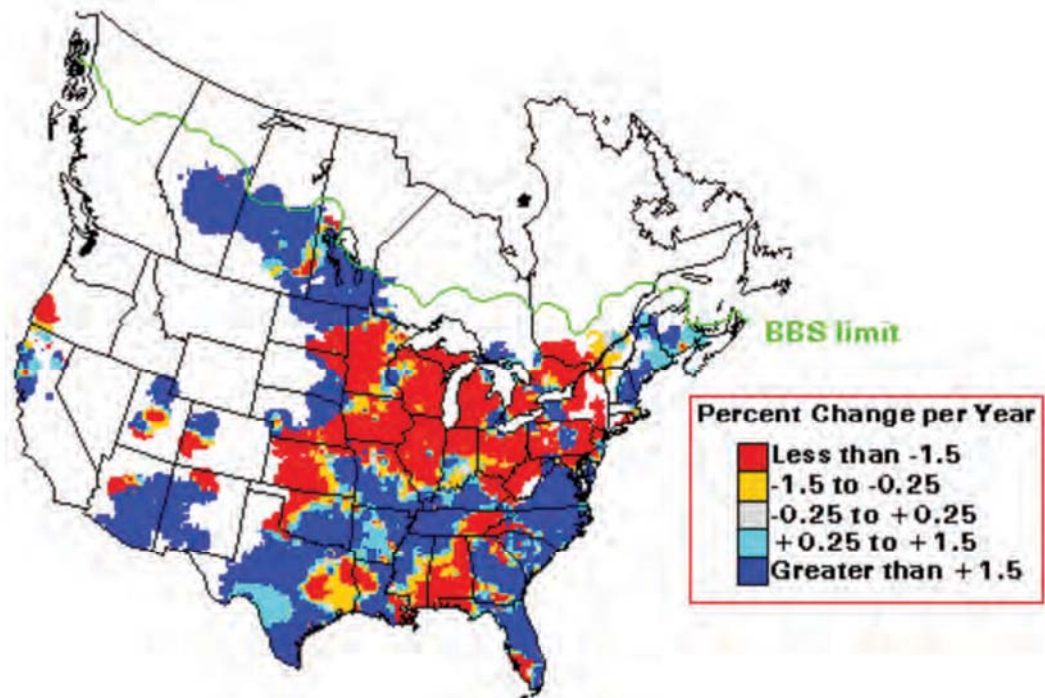


Figure 3. Mean percent change per year for Purple Martin, 1966-1996 (archived map, U. S. G. S. Breeding Bird Survey)

A reversal in trend is apparent in the southern Rolling Plains in northwest Texas.

Reasons for declines are not yet fully explained and may vary across the range. Weather has always played a role in short-term declines, especially in the northern states (Brown 1997). Prolonged cold and wet spells reduce insect activity for long enough periods that die-offs occur (Allan and Nice 1952; Brown 1997; Ray 1997, 2012a) and the frequency of these events can make it difficult for northern populations to recover (Brown 1997). Potential mismatches of migrations and resources due to climate change compound the problem in the north, and may have effects across the range (Fraser 2013). Changing demographics may also affect the availability of housing for the Purple Martin, and whether or not housing is managed to exclude the European Starling and House Sparrow. A colony of ~20 pairs of Purple Martins in the Texas Panhandle plummeted to zero in just three years after the human residents moved away, leaving the housing with the new homeowners who did not take interest in the martins, nor the House Sparrows and European

Starlings that proliferated at the site (Ray 2012c).

To date it has been difficult to focus concern on the Purple Martin in the eastern United States; it appears to be common and faring well in artificial housing. The decline in populations across most of the Gulf Coast states should not be over-looked simply because of the relative abundances that are still observed in those states. Monitoring of trends across that region and westerly throughout Texas is warranted. The tradition of erecting and managing housing for Purple Martins should be promoted across all demographics (age groups, ethnic groups, rural, urban) to help ensure the species future (JDR unpubl. data). Ray (2012a) is a source of guidelines for providing the Purple Martin with suitable nesting cavities and management. The booklet details the Purple Martin's life history, and offers suggestions for maximizing ones chances of attracting and maintaining a productive colony.

ACKNOWLEDGMENTS

I am grateful to B. Johnson, J. Siegrist and two anonymous reviewers for their reviews of early

drafts of this manuscript and to the U. S. Geological Survey's Breeding Bird Survey for coordination, storage, and analyses of data of the Breeding Bird Survey. The maps are courtesy of the U. S. Geological Survey.

LITERATURE CITED

- ALLEN, R. W., AND M. M. NICE. 1952. A study of the breeding biology of the Purple Martin (*Progne subis*). *American Midland Naturalist* 47: 606–665.
- BAKER, A. J., A. D. GREENSLADE, AND L. M. DARLING. 2008. High genetic diversity in the blue-listed British Columbia population of the purple martin maintained by multiple sources of immigrants. *Conservation Genetics* 9: 495–505.
- BENT, C. A. 1942. Life histories of North American flycatchers, larks, swallow, and their allies. U. S. National Museum Bulletin 179.
- BENSON, K. L. P., AND K. A. ARNOLD. 2001. The Texas breeding bird atlas. Texas A&M University System, College Station and Corpus Christi, TX. <http://txtbba.tamu.edu> (14 March 2014).
- BROWN, C. 1997. Purple Martin (*Progne subis*). Birds of North America. Philadelphia, PA: The American Ornithologists Union and The Academy of Natural Sciences. No. 287.
- FRASER, K. C., STUTCHBURY, B. J. M., SILVERIO C., KRAMER P. M., BARROW J., NEWSTEAD D., MICKLE N., COUSENS B. F., LEE J. C., MORRISON D. M., SHAHEEN T., MAMMENG P., APPLEGATE K., AND J. TAUTIN. 2012. Continent-wide tracking to determine migratory connectivity and tropical habitat associations of a declining aerial insectivore. *Proceedings of the Royal Society B-Biological Sciences*. 279 (1749):4901–4906. doi:10.1098/rspb.2012.2207 (accessed 4 April 2015).
- FRASER, K. C., SILVERIO C., KRAMER P., MICKLE N., AEPPLI R., AND B. J. M. STUTCHBURY. 2013. A trans-hemispheric migratory songbird does not advance spring schedules or increase migration rate in response to record-setting temperatures at breeding sites. *PloS ONE* 8(5): e64587. doi:10.1371/journal.pone.0064587
- CARLSBAD CAVERNS GUADALUPE MOUNTAINS ASSOCIATION. 1997. Birds checklist for Guadalupe Mountains National Park. Carlsbad Caverns Guadalupe Mountains Association. Unpaginated. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/guad.htm> (Version 22 May 1998). (Accessed 20 March 2015.)
- CHAMBERS, L. 1994. The starling-proof entrance hole. *Purple Martin Update* 5(1): 10–12.
- HALLMAN, C. A., R. P. B. FOPPEN, C. A. M. VAN TURNHOUT, H. . KROON, AND E. JONGEJANS. 2014. Declines in insectivorous birds are associated with high neonicotinoids concentrations. *Nature* 341–343.
- HILL, J. R. III. 1988. How to attract Purple Martins. *Purple Martin Update* 1(1): 1–3.
- LOPEZ, R. R., A. LOPEZ, R. N. WILKINS, C. C. TORRES, R. VALDEZ, J. G. TEER, AND G. BOWSER. 2005. Changing Hispanic demographics: challenges in natural resources management. *Wildlife Society Bulletin* 33: 553–564.
- LORD, B. AND B. LORD. 2010. Purple Martins in New Mexico. *Purple Martin Update* 19(3): 19.
- KOSTKA, K. 2001. Preliminary feedback on starling-resistant entrance holes. *Purple Martin Update* 10(2): 2–6.
- NEBEL, S., A. MILLS, J. D. MCCracken, AND P. D. TAYLOR. 2010. Declines of aerial insectivores in North America follow a geographic gradient. *Avian Conservation and Ecology—Écologie et conservation des oiseaux* 5(2): 1.
- PETERSON, J., AND B. R. ZIMMER. 1998. Birds of the Trans Pecos. University of Texas Press, Austin. <https://books.google.com> (accessed 4 April 2015).
- RAY, J. D. 1995. Purple martins in northwest Texas. *Purple Martin Update*. 6(3): 10–12.
- RAY, J. D., AND K. D. MOTE. 1997. A ground-based feeding strategy displayed by weather-stressed purple martins in the Texas Panhandle. *Purple Martin Update* 7(4): 24–25.
- RAY, J. D., AND G. R. YAKSICH. 1999. Tree-nesting Purple Martins in northeastern New Mexico. *Purple Martin Update* 9(2): 8–11.
- RAY, J. D. 2001. Purple Martin. The Texas Breeding Bird Atlas. Texas A&M University System, College Station and Corpus Christi, TX. <http://txtbba.tamu.edu> (accessed 14 March 2015).
- RAY, J. D. 2012a. The purple martin and its management in Texas. Fourth edition. Texas Parks and Wildl. Bull. PWD BK W7000-254 (9/12). (Accessed 14 March 2015).
- RAY, J. D. 2012b. Age composition of purple martin landlords (NW Texas and W. Oklahoma)—implications to conservation. *Purple Martin Update* 21(3): 18–19.
- RAY, J. D. 2012c. My thoughts on Purple Martin housing types out on the western edge. *Purple Martin Update* 21(2): 11–13.
- SAUER, J. R., AND W. A. LINK. 2011. Analysis Of The North American Breeding Bird Survey using hierarchical models. *The Auk* 128: 87–98.
- SAUER, J. R., J. E. HINES, J. E. FALLON, K. L. PARDIECK, D. J. ZIOLKOWSKI, JR., AND W. A. LINK. 2014. The North American Breeding Bird Survey, Results and Analysis 1966–2013. Version 01.30. USGS Patuxent Wildlife Research Center, Laurel, MD.
- SEYFFERT, K. D. 2001. Birds of the Texas Panhandle: their status, distribution, and history. Texas A&M University Press, College Station. 501 pp.
- STRECKER, J. K., JR. 1912. The birds of Texas: an annotated list. *Baylor University Bulletin* XV(1): 54. <https://books.google.com/books>. (Accessed 4 April 2015).

- TAROF, S., AND C. R. BROWN. 2013. Purple Martin (*Progne subis*), The Birds of North America Online <http://bna.birds.cornell.edu/bna/species/287> (accessed 14 March 2015).
- TAUTIN, J., B. COUSENS, K. KOSTKA, S. KOSTKA, AND D. AIROLA. 2009. Addressing regional declines in Purple Martin populations. Proceedings of the 4th International Partners in Flight Conference: Tundra to Tropics: 82-87.
- U. S. G. S. BREEDING BIRD SURVEY. 1996. Purple Martin (*Progne subis*) BBS trend map, 1966-1996 (archival). <http://www.mbr-pwrc.usgs.gov/bbs/htm96/trn626/tr6110.html> (accessed 14 March 2015).

¹E-mail: jclintoneitniece@gmail.com