

**Western Riverside County
Multiple Species Habitat Conservation Plan
Biological Monitoring Program**

2021 Purple Martin Survey Report



Purple Martin (*Progne subis*) survey site on Thomas Mountain in Riverside County, CA. Photo by Nicholas R. Peterson (California Department of Fish and Wildlife).

April 2022

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NOTE TO READER:

This report is an account of survey activities conducted by the Biological Monitoring Program for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP was permitted in June 2004. Reserve assembly is ongoing and is expected to take 20 or more years to complete. The Conservation Area includes lands acquired under the terms of the MSHCP and other lands that have conservation value in the Plan Area (called public or quasi-public lands in the MSHCP). In this report, the term “Conservation Area” refers to these lands as they were understood by the Monitoring Program at the time the surveys were conducted.

The Monitoring Program monitors the status and distribution of the 146 species covered by the MSHCP within the Conservation Area to provide information to Permittees, land managers, the public, and the Wildlife Agencies [i.e., the California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game) and the U.S. Fish and Wildlife Service]. Monitoring Program activities are guided by defined conservation objectives for each Covered Species, other information needs identified in MSHCP Section 5.3 or elsewhere in the document, and the information needs of the Permittees. A list of the lands where data collection activities were conducted in 2021 is included in Section 8.0 of the Western Riverside County Regional Conservation Authority (RCA) Annual Report to the Wildlife Agencies.

The primary author of this report was the 2021 Avian Program Lead, Nicholas Peterson.

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While we have made every effort to accurately represent our data and results, it should be recognized that data management and analysis are ongoing activities. Any reader wishing to make further use of the information or data provided in this report should contact the Monitoring Program to ensure that they have access to the best available or most current data.

Please contact the Monitoring Program Administrator with questions about the information provided in this report. Questions about the MSHCP should be directed to the Executive Director of the RCA. Further information on the MSHCP and the RCA can be found at www.wrc-rca.org.

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INTRODUCTION

The Purple Martin (*Progne subis*; also “martin”) is one of 45 bird species covered by the Western Riverside County Multiple Species Habitat Conservation Program (MSHCP) (Dudek & Associates 2003) and is a Species of Special Concern (breeding) in the State of California (Airola and Williams 2008). The statewide population is considered greatly reduced ($>40\%$ to $\leq 80\%$) since population estimates reported by Grinnell and Miller (1944), with a current estimate of 1000–10,000 birds. Additionally, the range size of Purple Martins in California is moderately reduced ($>20\%$ to $\leq 40\%$) since the publication of Grinnell and Miller (1944). Habitat loss, habitat degradation, or other human-induced threats are projected to moderately reduce ($>10\%$ to $\leq 15\%$) the species’ population in California by 2028 (Airola and Williams 2008).

Purple Martins are a rare migrant and breeder within the Plan Area, predominantly within the woodlands of foothills and within the montane areas (Garrett and Dunn 1981; Dudek & Associates 2003). Martins do not winter within the Plan Area and may be observed foraging or migrating throughout the Plan Area, specifically outside of suitable breeding habitat (Dudek & Associates 2003). Historic nesting locations within the Plan Area include Thomas Mountain and Dripping Springs areas (Patten 1998, personal communication, *in* Dudek & Associates 2003). Additional historic nest sites prior to 2021 included Lake Hemet as recently as 2012, and within the Cleveland National Forest (Dudek & Associates 2003). Finally, our Program’s biologists have detected martins within the Plan Area just six times before conducting 2021 surveys (Figure 1), with all detections occurring between 1 April and 31 July.

In general, martins in the western U.S. prefer to nest in woodpecker (Family Picidae) holes (Brown et al. 2021) within either snags (Airola and Williams 2008) or dead portions of live trees (Svoboda et al. 1980). Martins usually choose to nest within sycamores (*Platanus* spp.), conifers (Division Pinophyta; Airola and Williams 2008), or oaks (*Quercus* spp.; White et al. 2011) within southern California. Conifers are most frequently selected as nest sites by martins within California, with $>70\%$ of martins nesting in such trees (Airola and Williams 2008), although the Tehachapi Mountains of southern California contain the only known oak habitat in California in which martins persist (White et al. 2011). Rangewide, martins prefer nest sites that are <2600 m in elevation (Brown et al. 2021), and martins within the Tejon Ranch of southern California’s Tehachapi Mountains occupied elevations of 430–1830 m (White et al. 2011). Martins prefer nest sites that have open space above the nest and relatively abundant aerial insect prey nearby. Additionally, nest sites are typically surrounded by $\leq 20\%$ canopy cover at nest height and within 100 m of the nest tree (Airola and Williams 2008). Nest trees are often in prominent positions, usually on the upper slopes of hilly or mountainous terrain (Airola and Williams 2008). Finally, European Starlings (*Sturnus vulgaris*) are strong competitors with Purple Martins for nest sites and are thus generally rare or absent near martin nest sites (White et al. 2011).

Egg-laying and incubation by martins peaks between mid-April and late May, with a peak in nestling presence occurring from late May to late July (Brown et al. 2021). Clutches usually contain 3–6 eggs (Brown et al. 2021) that are incubated for 15–18 d

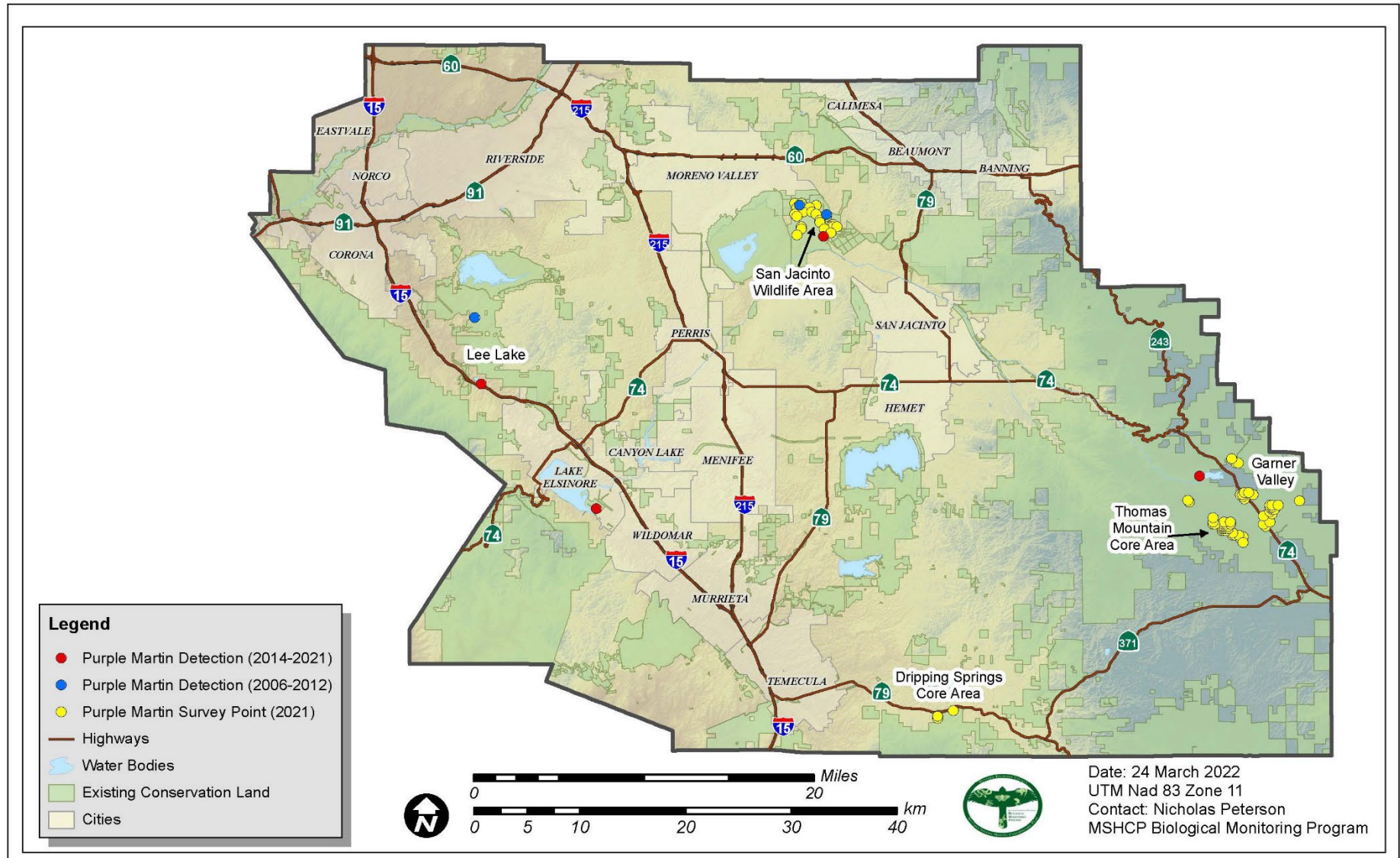


Figure 1. Locations of 2021 Purple Martin survey points, and Purple Martin detection locations by BMP biologists (2006-2021).

(Allen and Nice 1952; Finlay 1971; Brown et al. 2021). Nestlings typically fledge 28 or 29 d post-hatching (Allen and Nice 1952; Brown et al. 2021).

Threats to Purple Martins within California include removal of snags for fire management, loss of wetland habitat in which martin prey are produced, competition from cavity-nesting European Starlings, and incremental loss of sycamore woodland due to age and lack of regeneration (Airola and Williams 2008). Furthermore, conservation of martin habitat is complicated by the possibility that the species may require habitat features not yet identified by investigators, as illustrated by the fact that some areas go unused by the species despite containing apparently suitable habitat (Brown et al. 2021).

The MSHCP identifies three species objectives for Purple Martins. The first Objective requires the conservation of $\geq 45,020$ ac ($\geq 18,218$ ha) of suitable nesting and foraging habitat, including riparian scrub, forest, and woodland; deciduous woodland and forest; and montane coniferous forest. The second Objective requires the conservation of two Core Areas including Dripping Springs and Thomas Mountain. Finally, the third Objective requires the inclusion of microhabitat (i.e., groups of large snags) in potential nesting habitat within the MSHCP Conservation Area (Dudek & Associates 2003). Because it is not explicitly stated in the species objectives, we assume that we must document that Purple Martins are using $\geq 75\%$ of the aforementioned Core Areas at least once every eight years (*see* Volume I, Section 5.0, Table 5-8 of the MSHCP; Dudek & Associates 2003).

Goals and Objectives

1. Determine whether Purple Martins are using any of the Core Areas identified in the MSHCP, as well as Garner Valley and San Jacinto WA.
 - a. Conduct repeat-visit area searches, time permitting, within apparently suitable Purple Martin habitat in the aforementioned locations.

For this project, we surveyed for Purple Martins by conducting area searches within apparently suitable habitat in the two Core Areas identified by the MSHCP, as well as Garner Valley, which includes the area in which martins nested in 2012; and San Jacinto Wildlife Area (WA), in which 50% of our incidental detections of the species have occurred.

METHODS

Survey Design

We began study site selection by selecting Purple Martin habitats that were identified as suitable nesting and foraging habitat (i.e., riparian scrub, forest, and woodland; deciduous woodland and forest; and montane coniferous forest) by the MSHCP (Dudek & Associates 2003) within our ArcGIS (ESRI 2019) vegetation layer (CDFG et al. 2005). After we identified appropriate martin habitat in GIS, we clipped that layer to a separate GIS layer consisting of the two Purple Martin Core Areas designated by the MSHCP, plus Garner Valley and San Jacinto WA. Next, we generated regularly-spaced survey points separated from one another by 200 m within our aforementioned survey areas.

During the fall of 2020 and winter of 2020-2021, we visited all potential survey sites within the aforementioned areas to determine their suitability for Purple Martins, and accessibility for our biologists. We then conducted area search surveys for Purple Martins (White et al. 2011) from April through July by making one or two visits to survey points ($n = 81$ points) within the two MSHCP-identified Core Areas, and Garner Valley and San Jacinto WA (Figure 1).

Field Methods

We started surveys on 15 April because this would be early in the egg-laying period for local martins. We conducted surveys through 30 July 2021, at which point most nestlings would have fledged (Brown et al. 2021). We defined individual survey efforts by a single survey point around which we conducted an area search for Purple Martins. Survey points were within apparently suitable habitat for Purple Martins, and we separated them by ≥ 200 m. Observers conducted area searches within 100 m of each survey point (White et al. 2011) and each survey point was surveyed once or twice during this project.

We conducted surveys between 0730 h and 1330 h (White et al. 2011) and did not conduct surveys during periods of rain, heavy fog, or when maximum wind speed > 24 km/h. Surveys began when a pair of observers reached a survey point. Upon arrival, observers recorded on their data sheet (Appendix A) the date, their initials, and the survey point number. They then recorded the starting weather, temperature, wind speed, and survey start time. Observers then separated from one another and conducted an area search for martins within 100 m (3.14 ha) of the survey point after these initial data were recorded. Observers spent approximately 30 min conducting the area search for Purple Martins (White et al. 2011), paying particular attention to snags or dead portions of live trees that contained woodpecker holes.

During surveys, observers recorded in a notebook information for all bird species detected. For non-covered species, observers recorded information for only the first individual of that species detected, which provided species richness data for the site. For such species, observers recorded the four-letter species code, age class information, and sex. For Covered Species, observers recorded the four-letter species code, age class, and sex for every individual detected during the survey. If observers were unsure whether they had already recorded data on an individual (i.e., they were double-counting), they erred on the side of caution and recorded information on that individual. At the conclusion of the 30-min period, observers met at the survey point and recorded on their data sheet (Appendix A) the ending environmental data and the survey end time.

RESULTS

Detections of Focal Species

We did not detect Purple Martins while conducting our focused surveys in 2021. Our Program Biologists have, however, detected martins in one (50%) Core Area during the current eight-year reporting period (2014–2021). This detection occurred in July 2021 and was an incidental detection, i.e., it did not occur while we were conducting our focused surveys. We initially received a report from a local birder, Dave Goodward, of

Purple Martins on the south side of Lake Hemet. Mr. Woodward indicated that he had identified several adult martins occupying a nest tree on a slope on the south side of Lake Hemet. Two of our biologists, Nathan Pinckard and Nicole Tomes-Orlale, visited the site on 30 July and confirmed the presence of at least five adult martins on a slope south of Lake Hemet, which is the northern side of Thomas Mountain (Figure 1), a Core Area for Purple Martins.

Within the current reporting period we have detected Purple Martins three additional times on Conserved Land. One of these detections happened in May 2014 and was on the southern end of Lee Lake, which is along Interstate 15 north of Lake Elsinore. A second detection was in June 2014 near the southern end of Lake Elsinore. A third detection occurred in May 2015 within the Davis Unit of the San Jacinto WA (Figure 1).

Prior to the current reporting period, our Program biologists detected Purple Martins on Conserved Land two times (April 2006 and May 2012) within the Davis Unit of the San Jacinto WA, and once (July 2006) within the Estelle Mountain Reserve south of Lake Mathews (Figure 1). We have never detected Purple Martins within the Dripping Springs Core Area. Overall, then, we have detected Purple Martins seven times on Conserved Land since 2006. Finally, we detected 142 avian species during our 2021 surveys for Purple Martins (Appendix B); of these, 22 are covered by the MSHCP.

DISCUSSION

Detections of Focal Species

Within the current reporting period (2014–2021) we observed Purple Martins using Conserved Land in one (50%) of the two designated Core Areas. As a result, the objective requiring use of $\geq 75\%$ of designated Core Areas by Purple Martins does not currently appear to be met.

Our area searches within the Thomas Mountain and Garner Valley areas covered approximately 91 and 82 ha of apparently suitable martin habitat, respectively. Both areas contained suitable martin habitat characteristics such as snags (Airola and Williams 2008) or live trees with dead sections (Svoboda et al. 1980); abundant conifers; open space above snags (Airola and Williams 2008), which were often isolated and designated by the U.S. Forest Service as wildlife habitat; elevations < 2600 m (Brown et al. 2021); and a general lack of European Starlings (White et al. 2011). None of the conifer snags within our Garner Valley sites were situated along upper slopes of hilly or mountainous terrain. Snags near our Thomas Mountain survey sites, however, were often within this habitat that is preferred by nesting martins (Airola and Williams 2008), although we did not detect any martins at these sites in 2021, nor have we ever detected them near those sites. The martins we documented in 2021 on the north side of Thomas Mountain were apparently nesting in a snag that was on mountainous terrain and was toward the upper slope of the mountain. The site also had all of the aforementioned suitable site characteristics for martins, including an elevation of approximately 1450 m. Finally, this location was 2 km from our nearest survey site, which may partially explain why we did not detect the birds during our focused surveys.

We were restricted to surveying just three sites (9.4 ha of martin habitat) within the Dripping Springs Core Area because much of the potentially suitable habitat is near Vail Lake and is currently not Conserved Land. The areas we surveyed contained some habitat features potentially conducive to nesting martins, including a few snags, specifically sycamores, above which there was open space (Airola and Williams 2008); and elevations <2600 m (Brown et al. 2021). The site lacked other characteristics that are preferred by martins, such as potential nest sites on upper slopes of hilly or mountainous terrain (Airola and Williams 2008) and an absence of European Starlings (White et al. 2011).

The Davis Unit of the San Jacinto WA contains about 24 ha of potentially suitable breeding habitat for Purple Martins. In addition, the site supports abundant aerial insect prey, as evidenced by the presence of several species of swallows (Family Hirundinidae) that are aerial insectivores. This may provide some insight into why three (42.9%) of our seven martin detections since 2006 have occurred on this property. All three detections occurred within 250 m of standing water and also occurred during the peak egg-laying and incubation periods for martins (i.e., mid-April through late May; Brown et al. 2021), but our biologists were unable to determine the breeding status of the martins they observed. The Davis Unit has some sycamores and is <2600 m in elevation, both of which are preferred by nesting martins (White et al. 2011; Brown et al. 2021); however, the flat topography and the relative abundance of European Starlings occupying the few available snags may ultimately preclude use by breeding Purple Martins (Airola and Williams 2008; White et al. 2011). Overall, the fact that we have detected martins here just three times since 2006, despite thousands of hours of survey time for a variety of species, suggests that Purple Martins are rare visitors.

Our remaining three martin detections since 2006 occurred in the western portion of the Plan Area (Figure 1). One detection occurred in late July 2006 in the Estelle Mountain Reserve that is south of Lake Mathews. The martin was observed using a thin strip of riparian vegetation surrounded by grasslands. This bird was probably a migrant based upon the site's apparently poor nesting and foraging habitat, combined with the time of year during which the observation occurred. A second detection occurred near Lee Lake in early May 2014 and could have been a nesting bird based upon the time of year (Brown et al. 2021), but we did not have any evidence to support this. Unfortunately, Lee Lake has dried considerably since 2014, with loss of some potential nesting trees. Finally, the third detection occurred south of Lake Elsinore in mid-June 2014, which is within the peak of the nestling period for Purple Martins (late May through late July; Brown et al. 2021); however, our biologists were not able to determine whether the martin was a breeding individual. The area does not generally have many snags in which martins could nest, although it is likely an ideal foraging area for aerial insects due to its proximity to water.

Overall, apparently suitable habitat for breeding Purple Martins seems to be relatively abundant within Garner Valley and on Thomas Mountain. Despite the apparent abundance of suitable habitat, however, we were only able to detect one martin nest site in 2021, following a tip by Dave Goodward. Apparently suitable habitat that is unused may suggest that martins require habitat features not yet identified by investigators (Brown et al. 2021). Finally, the fact that our biologists have detected Purple Martins just

seven times within the Plan Area since 2006 suggests that martins do not occur in large numbers in western Riverside County.

Recommendations

Future Surveys

Future surveys should be repeated at least once every eight years at the sites we surveyed in 2021 and should include at least some observation time focused near the nest site we observed in 2021. If additional suitable habitat near Vail Lake is acquired for conservation, we should add survey sites there as well, because our observations of the area suggest that the perimeter of Vail Lake contains habitat that may be used by foraging and nesting martins.

We should investigate potential martin habitat within the Cleveland National Forest (NF) in the western part of the Plan Area (i.e., the Santa Ana Mountains) only if time permits or our biologists incidentally detect martins in the area. This general location is cited by the MSHCP as containing a “possible” martin nesting location, but substantiating evidence is not provided in the Plan documents, nor was any found by the Avian Program Lead during literature review for this report.

Conservation and Management

Efforts should be made to designate as Core Areas for Purple Martins locations in MSHCP conservation and in which our biologists detect Purple Martins. These locations may include Lake Elsinore, Lake Mathews-Estelle Mountain, Lee Lake, or the San Jacinto Wildlife Area. Inclusion of these locations as Core Areas may accurately reflect the habitats being used by Purple Martins, and may make it more likely that we can meet the use objective for the species.

Future work aimed at conserving habitat for Purple Martins should focus on preserving conifer, sycamore, and oak snags, as well as preventing use of these sites by European Starlings and House Sparrows (*Passer domesticus*). Specifically, site managers may want to consider trapping or otherwise eliminating House Sparrows and European Starlings in the vicinity, which may increase the likelihood of martins occupying martin houses (Fouts 1996). Finally, it may be worthwhile to erect several martin houses within the San Jacinto WA given that we have detected martins using the area three times, and there is some evidence that western martins will use such artificial structures (Airola et al. 2018).

ACKNOWLEDGMENTS

We thank the land managers in the MSHCP Plan Area, who in the interest of conservation and stewardship facilitate Monitoring Program activities on the lands for which they are responsible. Funding for the Biological Monitoring Program is provided by the Western Riverside Regional Conservation Authority and the California Department of Fish and Wildlife. Program staff who conducted surveys in 2021 were Masanori Abe, Cristina Juran, Nicholas Peterson, Nathan Pinckard, and Nicole Tomes-Orlale. Finally, we thank and acknowledge Dave Woodward and Robert Packard for providing information on Purple Martins that were near Lake Hemet in 2021.

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Appendix A. 2021 Purple Martin survey data sheet.

[illegible]

Appendix B. Avian species detected during 2021 Purple Martin surveys. Species in bold are covered by the MSHCP.

COMMON NAME	SCIENTIFIC NAME
Acorn Woodpecker	<i>Melanerpes formicivorus</i>
Allen's Hummingbird	<i>Selasphorus sasin</i>
American Avocet	<i>Recurvirostra americana</i>
American Coot	<i>Fulica americana</i>
American Crow	<i>Corvus brachyrhynchos</i>
American Goldfinch	<i>Spinus tristis</i>
American Kestrel	<i>Falco sparverius</i>
American Pipit	<i>Anthus rubescens</i>
American Robin	<i>Turdus migratorius</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
American Wigeon	<i>Mareca americana</i>
Anna's Hummingbird	<i>Calypte anna</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Audubon's Warbler	<i>Setophaga auduboni auduboni</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Band-tailed Pigeon	<i>Patagioenas fasciata</i>
Barn Swallow	<i>Hirundo rustica</i>
Bell's Sparrow	<i>Artemisiospiza belli</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
Black Phoebe	<i>Sayornis nigricans</i>
Black-chinned Sparrow	<i>Spizella atrogularis</i>
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
Black-necked Stilt	<i>Himantopus himantopus</i>
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>
Blue Grosbeak	<i>Passerina caerulea</i>
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Brown Creeper	<i>Certhia americana</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Bufflehead	<i>Bucephala albeola</i>
Bullock's Oriole	<i>Icterus bullockii</i>
Bushtit	<i>Psaltiriparus minimus</i>
California Gull	<i>Larus californicus</i>
California Horned Lark	<i>Eremophila alpestris actia</i>
California Quail	<i>Callipepla californica</i>
California Scrub-Jay	<i>Aphelocoma californica</i>
California Thrasher	<i>Toxostoma redivivum</i>
California Towhee	<i>Melospiza crissalis</i>
Canada Goose	<i>Branta canadensis</i>

Appendix B. Continued.

COMMON NAME	SCIENTIFIC NAME
Canyon Wren	<i>Catherpes mexicanus</i>
Caspian Tern	<i>Hydroprogne caspia</i>
Cassin's Finch	<i>Haemorhous cassinii</i>
Cassin's Kingbird	<i>Tyrannus vociferans</i>
Cattle Egret	<i>Bubulcus ibis</i>
Chipping Sparrow	<i>Spizella passerina</i>
Cinnamon Teal	<i>Spatula cyanoptera</i>
Clark's Grebe	<i>Aechmophorus clarkii</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
Coastal California Gnatcatcher	<i>Polioptila californica californica</i>
Common Raven	<i>Corvus corax</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
Costa's Hummingbird	<i>Calypte costae</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Downy Woodpecker	<i>Dryobates pubescens</i>
Eared Grebe	<i>Podiceps nigricollis</i>
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>
European Starling	<i>Sturnus vulgaris</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Gadwall	<i>Mareca strepera</i>
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Ardea alba</i>
Great Horned Owl	<i>Bubo virginianus</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Great-tailed Grackle	<i>Quiscalus mexicanus</i>
Green-winged Teal	<i>Anas crecca</i>
Hairy Woodpecker	<i>Dryobates villosus</i>
Hermit Warbler	<i>Setophaga occidentalis</i>
House Finch	<i>Haemorhous mexicanus</i>
House Wren	<i>Troglodytes aedon</i>
Hutton's Vireo	<i>Vireo huttoni</i>
Killdeer	<i>Charadrius vociferus</i>
Lark Sparrow	<i>Chondestes grammacus</i>
Lawrence's Goldfinch	<i>Spinus lawrencei</i>
Least Bell's Vireo	<i>Vireo bellii pusillus</i>
Lesser Goldfinch	<i>Spinus psaltria</i>
Lesser Scaup	<i>Aythya affinis</i>

Appendix B. Continued.

COMMON NAME	SCIENTIFIC NAME
Lincoln's Sparrow	<i>Melospiza lincolnii</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Long-billed Curlew	<i>Numenius americanus</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh Wren	<i>Cistothorus palustris</i>
Mountain Chickadee	<i>Poecile gambeli</i>
Mountain Quail	<i>Oreortyx pictus</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Flicker	<i>Colaptes auratus</i>
Northern Harrier	<i>Circus hudsonius</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Northern Pintail	<i>Anas acuta</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Northern Shoveler	<i>Spatula clypeata</i>
Nuttall's Woodpecker	<i>Dryobates nuttallii</i>
Oak Titmouse	<i>Baeolophus inornatus</i>
Olive-sided Flycatcher	<i>Contopus cooperi</i>
Orange-crowned Warbler	<i>Leiothlypis celata</i>
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>
Phainopepla	<i>Phainopepla nitens</i>
Pied-billed Grebe	<i>Podilymbus podiceps</i>
Pine Siskin	<i>Spinus pinus</i>
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
Purple Finch	<i>Haemorhous purpureus</i>
Pygmy Nuthatch	<i>Sitta pygmaea</i>
Red Crossbill	<i>Loxia curvirostra</i>
Redhead	<i>Aythya americana</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Ring-billed Gull	<i>Larus delawarensis</i>
Rock Pigeon	<i>Columba livia</i>
Ruby-crowned Kinglet	<i>Corthylio calendula</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Say's Phoebe	<i>Sayornis saya</i>
Snowy Egret	<i>Egretta thula</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Song Sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
Southern California Rufous-crowned Sparrow	<i>Aimophila ruficeps canescens</i>

Appendix B. Continued.

COMMON NAME	SCIENTIFIC NAME
Spotted Towhee	<i>Pipilo maculatus</i>
Steller's Jay	<i>Cyanocitta stelleri</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Townsend's Warbler	<i>Setophaga townsendi</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Turkey Vulture	<i>Cathartes aura</i>
Violet-green Swallow	<i>Tachycineta thalassina</i>
Western Bluebird	<i>Sialia mexicana</i>
Western Grebe	<i>Aechmophorus occidentalis</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Western Tanager	<i>Piranga ludoviciana</i>
Western Wood-Pewee	<i>Contopus sordidulus</i>
White-breasted Nuthatch	<i>Sitta carolinensis aculeata</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
White-faced Ibis	<i>Plegadis chihi</i>
White-headed Woodpecker	<i>Dryobates albolarvatus</i>
White-tailed Kite	<i>Elanus leucurus</i>
White-throated Swift	<i>Aeronautes saxatalis</i>
Wilson's Warbler	<i>Cardellina pusilla</i>
Wrentit	<i>Chamaea fasciata</i>
Yellow Warbler	<i>Setophaga petechia</i>
Yellow-rumped Warbler	<i>Setophaga coronata</i>