NOTES

PURPLE MARTIN DISTRIBUTION AND NESTING HABITAT AT SHASTA LAKE, CALIFORNIA

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The Purple Martin (*Progne subis*) is a local and generally uncommon to rare summer visitor in the western U.S. Once considered fairly common in California (Grinnell and Miller 1944), it has suffered population decline over much of its former breeding range (Remsen 1978, Airola and Williams 2008). It is currently designated as a species of special concern by the California Department of Fish and Game (Shuford and Gardali 2008). Most of the known California population nests in the northwestern portion of the state, but the species also nests at scattered locations throughout the state's non-desert regions (Small 1994, Airola and Williams 2008). In the Central Valley of northern California, the Purple Martin is known to nest only at several urban locations around Sacramento (Airola and Grantham 2003, Airola and Kopp 2007). In interior northern California, the only recent known breeding locations are scattered in central Siskiyou and eastern Shasta counties, the latter including a regular population at Shasta Lake (Williams 1998, Airola and Williams 2008). The Shasta Lake population is large for the interior portion of California and has been monitored better than the other sites. Because of the Purple Martin's wide distribution, low density, use of relatively inaccessible areas, and use of ephemeral, wildfire-created habitats (Airola and Williams 2008) its population trends are difficult to track. Therefore any information on local populations as an indication of the species' overall trend is useful.

Purple Martins have been known to nest at Shasta Lake for at least 30 years, as reported by Williams (1988) and Hill et al. (2004). Since 2001, however, their distribution, population status, and nesting habitats in this area have not been reported. Most previous nests were in partially submerged snags of drowned conifers in the Pit River arm of the lake. This section is the only part of the lake's footprint that was not logged before the reservoir was filled, leaving an abundance of submerged snags in this arm and its many tributaries.

During studies related to reservoir management at Shasta Lake between 2003 and 2006, I recorded anecdotal information on the Purple Martin's presence and distribution. Additionally, I evaluated historical information and results of a lakewide breeding-bird survey in 2007 to determine the martins' general locations. These data suggested where Purple Martin surveys should be focused, that is, in the Pit River arm. In 2007, I followed through with the survey.

Shasta Lake lies 16 km north of Redding in Shasta County, California (Figure 1). It consists of the main body and five primary arms: Big Backbone and Squaw creeks and the Sacramento, McCloud, and Pit rivers. Shasta Lake covers 121 km^2 and has 676 km of shoreline. The full-pool elevation of the lake is 326 m, and the surrounding terrain is moderate to steep.

I surveyed for nesting Purple Martins over 20 hours on five days between 9 May and 25 June 2007. I located and identified active nests by scanning and listening for Purple Martins and observing nesting behaviors, including nest building, feeding nestlings, nestlings seen or heard, or birds remaining in a cavity as if incubating. I conducted surveys by boat during all daylight hours, though most took place during the morning when the birds were more active near their nests.

I found eleven nest colonies at eight general locations (Figure 1). Colonies ranged in size from one to three pairs using one or two individual nest trees. Thirty-eight individual Purple Martins were observed. Sixteen nesting pairs and their individual

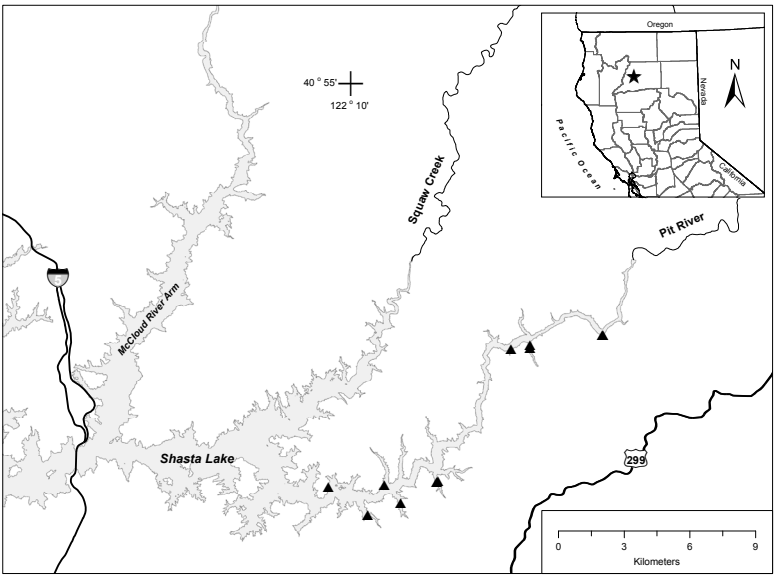

Figure 1. Purple Martin nest colony locations at Shasta Lake, Shasta County, California during 2007.

nest cavities were confirmed, while two additional nesting pairs were suspected but their nest cavities were not confirmed. Collectively, 18 nesting pairs were confirmed and/or suspected. All nests were located in old Acorn Woodpecker (*Melanerpes formicivorus*) nest cavities within conifer snags. All nest colonies but one were located in submerged snags within the lake's normal inundation zone (e.g., Figures 2, 3). The only colony not in a submerged snag, at Reno Canyon, was on a small ridge top above the lake in a large (81 cm diameter at breast height) ponderosa pine (*Pinus ponderosa*) snag. I observed five Purple Martins regularly at this location and confirmed two pairs using two separate nest cavities.

These results are similar to those reported by Williams (1988) and Hill et al. (2004) in which 17, 14, 19, and 18 pairs were counted during 1978, 1994, 1995, and 2001, respectively, indicating that the Purple Martin's population levels at Shasta Lake are generally stable. Shasta Lake continues to support an important component of the overall northern California Purple Martin population, ranging from 14 to 51% of the interior northern California population estimated by Williams (1988) and Airola and Williams (2008).

Although there are several historical records from the McCloud River arm (S. Glover pers. comm.), Purple Martins now occur mainly in the Pit River arm of Shasta Lake, likely because of the abundance of inundated snags in this portion of the lake. Additionally, adjacent upland habitats in this area also have more conifers than do most of the uplands around other areas of the lake. In 1999 and 2004 two large wildfires also burned around the southwestern portion of the Pit River arm, leaving an abundance of snags adjacent to the lake. Over time, primary cavity-nesting birds will create additional potential nesting habitat for Purple Martins in these areas.

Following the same general techniques and at the same level of effort as in 2007, I surveyed Shasta Lake for Purple Martins again from May to July 2008, finding 14

Figure 2. Purple Martin nest site in a flooded snag at Roberts Canyon, Shasta Lake.

Photo by Len Lindstrand III

Figure 3. Male Purple Martin at nest cavity, Shasta Lake.

Photo by Len Lindstrand III

nest colonies at 10 general locations. Colonies ranged in size from one to five pairs using one or two individual nest trees. I confirmed 20 nesting pairs and their nest cavities and suspected but did not confirm the cavity of one additional pair. All nests were in conifer snags, and all but one were within the lake's inundation zone. One colony, near Jones Valley, was on a small ridge above the lake in a large ponderosa pine snag in an area burned by the recent wildfires.

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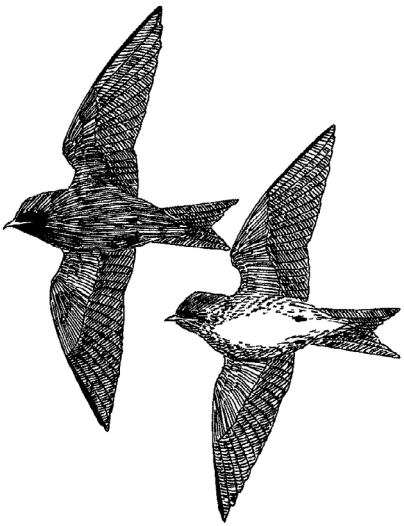

Purple Martins

Sketch by George C. West