



Northern Channel Islands Loggerhead Shrike Study

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Background and Purpose:

The Channel Islands are a very diverse ecosystem home to numerous endemic species. Rapid changes over the last two hundred years, including human impacts associated with ranching, combined with the relatively small size of the islands, can threaten island endemics. As Channel Islands National Park transitions from decades of ranch operations to a preservation and restoration management orientation, it is crucial to monitor island endemics to ensure responsible resource management.

Northern island loggerhead shrikes (*Lanius ludovicianus anthonyi*) are an endemic, genetically distinct subspecies of loggerhead shrike found on California's Santa Rosa and Santa Cruz Islands and possibly as far south as Santa Catalina Island. The sub species *L. l. anthonyi*, is genetically distinct from mainland subspecies and the San Clemente Island subspecies *L. l. mearnsi*. This species has been listed as a Species of Special Concern by the California Department of Fish and Game. Up until 2009, the current numbers of loggerhead shrikes breeding on Santa Rosa and Santa Cruz islands in the Santa Barbara Channel were not precisely known, but it was suspected that they were low (Hicks and Walter 2009). Surveys have been conducted on both islands in the past few years, but only limited portions of the islands have been surveyed specifically for shrikes, and the survey designs did not allow for inferences to unsampled areas. Because the U.S. Fish and Wildlife Service was petitioned to list the subspecies and afford it federal protection under the Endangered Species Act, the objective of a 2009-2010 project was to obtain a rigorous and defensible estimate of northern island loggerhead shrike abundance on both islands.



The loggerhead shrike, a predatory songbird, is notorious for impaling and caching its prey on sharp objects.
Photo: Andrew Fisher

In 2007 the National Park Service's (NPS) Channel Islands National Park and Southern California Research Learning Center (SCRLC) approached biologists with the U.S. Geological Survey (USGS) and the Western Foundation of Vertebrate Zoology (WVZ) to develop a plan to survey the islands. Early consultation was provided by the United States Navy, which manages San Clemente's endemic loggerhead shrike population. The methodology developed for the project was similar to the methodology used during the Loggerhead Shrike surveys on San Clemente Island, wherein surveys rely heavily on the talents of volunteer observers in the field.

Methods:

Surveys were conducted in sample units chosen by the island shrike team in a stratified random manner across Santa Rosa and Santa Cruz islands.





Fledging shrikes from the “airstrip pair” on Santa Cruz Island compete for food.

Photo: Lyndal Laughrin, Santa Cruz Island UC Reserve.

Survey unit size averaged between 265 and 280 hectares on both Santa Cruz and Santa Rosa Islands. Over 200 citizen science volunteer opportunities were provided to conduct the field surveys between 2009 and 2010. In both years Santa Rosa units were surveyed in April and Santa Cruz units were surveyed in May. Volunteers selected for this project were required to have intermediate to advanced experience counting and identifying bird species by sight and sound, hiking over rough terrain without trails, and using topographic maps and hand-held GPS units.

Each unit surveyed was completed using a double independent observer method. In this protocol two volunteers survey the same area on roughly the same path no closer than 500m from each other. The observers hike the terraces, side slopes and canyon bottoms completely independent of each other, but still covering the unit as completely as possible. It was paramount that the surveyors not alert each other to the presence of shrikes, or flush the birds out of the area. This double independent methodology allowed the project team to generate a detection probability for shrikes in each unit surveyed, that could be extrapolated to the unsampled areas of the island. Despite the rugged terrain, limited time and sheer size of the islands, 23% of the total area of both islands was surveyed. These field data, combined with a strong statistical model, allowed for defensible inferences to the unsampled areas of each island.

Results:

Although Santa Rosa had markedly higher shrike observations than Santa Cruz, the surveys seemed to yield relatively low numbers on both islands. Shrike abundances were estimated to be 169 in 2009 and 240 in 2010 for Santa Rosa Island, and 35 in 2009 and 42 in 2010 for Santa Cruz Island.

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Additional Resources:

Stanley, T., Teel, S., Hall, L., Dye, L., Laughrin, L., (2012) Population Size of Island Loggerhead Shrikes on Santa Rosa and Santa Cruz Island. *Wildlife Society Bulletin* 36(1):61–69; 2012

Cade, T.J. & Woods, C.P. (1997) Changes in the distribution and abundance of the Loggerhead Shrike. *Conservation Biology*, 11, 21-31.

Eggert, L.S. Mundy, N.I., Woodruff, D.S. (2004) Population structure of loggerhead shrikes in the California Channel Islands. *Mol Ecol* (2004) 13: 2121-33.

Hicks, J.J. and H.S. Walter (2009) Population decline of the island loggerhead shrike (*Lanius ludovicianus anthonyi*) in the California Channel Islands. *Wilson J. of Ornithology* 121(1):184-187.

Mundy, N.I., Winchell, C.S. and Woodruff, D.S. (1997) Genetic differences between the endangered San Clemente Island loggerhead shrike *Lanius ludovicianus mearnsi* and two neighbouring subspecies demonstrated by mtDNA control region and cytochrome *b* sequence variation. *Molecular Ecology* 1997, 6, 29–37.