

APPENDIX 1

History of Documentation of Three Species of Breeding Storm-Petrels in the California Channel Islands

Leach's Storm-Petrel: LESP was the most abundant breeding storm-petrel species at the Coronado Islands, just south of the CCI, in 1895 to 1902 (Anthony 1898, Grinnell & Daggett 1903; see Fig. 1B for storm-petrel breeding locations in the CCI and northwestern Baja California). North of the CCI, the species was first documented breeding in central California at the South Farallon Islands in 1896 and then in northern California at Flatiron Rock and Prisoner's Rock off Trinidad in 1910 (Loomis 1896, Osborne 1972, Carter *et al.* 2015). Hunt *et al.* (1979) reported that a specimen of an adult ASSP, one of four collected from crevices on Castle Rock off San Miguel Island on 14 May 1968 (Crossin & Brownell 1968), was actually a misidentified LESP, based on re-examination of the specimen by R. Clapp. However, in 1996, G.J. McChesney (unpubl. data) re-examined this specimen (US National Museum 544522) and considered it to be an ASSP. In 2015, this specimen was rechecked by museum staff and still considered to be an ASSP (J. Saucier, pers. comm.). In October 1991, one ASSP also had been captured in a mist-net and a nearly-fledged unidentified storm-petrel chick was found in a crevice on Castle Rock (off San Miguel Island), further suggesting nesting use of this rock by ASSP (Carter *et al.* 1992). Small numbers of LESP (some with a brood patch) have been captured in mist nets at Prince Island (off San Miguel Island), Santa Barbara Island, Scorpion Rock (off Santa Cruz Island), and Seal Cove South Rock off San Clemente Island (Hunt *et al.* 1979, Ainley 1980, Power & Ainley 1986, Carter *et al.* 1992, Howell *et al.* 2009, Carter & Henderson 2015, Adams *et al.* 2016). The first verified nests of the LESP in the CCI were found at Ship Rock, Catalina, in 2014-2015, although

1903 and 1937 egg records likely also were from LESP nests (this study). The remains of a LESP or BLSP were found at Anacapa Island on 5 July 1912, but no nests were found; likely the carcass had been dropped by an avian predator (Wright & Snyder 1913).

Ashy Storm-Petrel: In the early twentieth century, ASSP were generally considered to only breed only at the South Farallon Islands (central California) where the supposed first nest of the species was reported in 1885 (Ingersoll 1886; Carter *et al.* 2015). However, the earliest breeding record for this species actually occurred at San Miguel Island in the northern CCI, as later reported by Willett (1912). Even though Willett (1910) had not been able to find ASSP nests at Prince Island in June 1910, an adult ASSP specimen (The Natural History Museum 88.10.10.3734) had been obtained at San Miguel Island and given to H.W. Henshaw by Captain S. Forney in 1875 (Henshaw 1876). Forney stated that “the species bred on San Miguel Island in great numbers. As usual, they were nesting in burrows...” (Henshaw 1876:277). Given that ASSP typically nest in crevices, two potential explanations exist for this historical report of use of burrows by great numbers of ASSP at San Miguel Island:

- (1) “great numbers” may have reflected the presence of abundant Cassin’s Auklet *Ptychoramphus aleuticus* burrows at either Prince Island or Castle Rock. The adult specimen may have been discovered nesting in an auklet burrow after auklets had finished breeding for the year but it is unclear exactly how it was obtained; or
- (2) “burrows” may have been inaccurate wording that actually referred to crevices. However, only a few crevice nests of ASSP have been found at Prince Island and

Castle Rock in recent decades, despite estimates of hundreds of breeding pairs based on mist-net captures (Hunt *et al.* 1979, 1980; Carter *et al.* 1992, unpubl. data). Loss of much accessible crevice-nesting habitat at Prince Island may have occurred when about 18 tons of guano were removed in 1895 and seabird breeding habitats on at least parts of Prince Island were severely affected (SDU 1895, SFC 1895, Doran 1980). Given few nests found but relatively large numbers of birds captured in mist nets in 1976, 1991 and 1994 at Prince Island (Hunt *et al.* 1979, 1980; Carter *et al.* 1992, H. Carter, unpubl. data), most ASSP may now breed mainly in inaccessible habitats in cliffs or use auklet burrows after auklets have finished breeding.

Nesting at Santa Cruz Island was first well documented in 1912 and 1913, when ASSP eggs, chicks and adults were noted and collected at Painted Cave (Wright & Snyder 1913, Hunt *et al.* 1979, McIver *et al.* 2016). Shortly thereafter, breeding of ASSP at the Coronado Islands was reported in 1916 (Huey 1925, Willett 1933). In 1976 and 1977, nests were first noted at Santa Barbara Island (Hunt *et al.* 1979). Breeding may not have been detected there by earlier workers who rarely examined Sutil Island (off Santa Barbara Island) and other difficult-to-access habitats on the main island. However, earlier breeding was suggested when, in late March 1904, “dozens” came aboard the *Albatross* while anchored at the island (Miller 1936) and one bird flew aboard the *Velero III* at the island on 26 April 1940 (Los Angeles County Museum 50 584). On the other hand, ASSP might not have bred at Santa Barbara Island in the early twentieth century. None was found in June 1911 by Willett (1912, 1933), who conducted a careful search for crevice-nesting seabirds at Sutil Island (where he found Cassin’s Auklets breeding) and

other accessible parts of the main island. In 1996, the first nest was reported at San Clemente Island on Seal Cove South Rock (Carter *et al.* 2008), although only a presumably incubating adult was observed. The first nests with an egg were noted there in 2013-2015 (Carter & Henderson 2015; H. Carter, unpubl. data). However, more work is needed to verify species identification at San Clemente Island, located near Catalina, in light of identification issues raised in this paper. Possible breeding was first noted at Anacapa Island in 1994, based on mist-net captures of 50 birds (Carter *et al.* 2008). However, the first nest with a chick was found at Anacapa in 2011 (Harvey *et al.* 2016).

Black Storm-Petrel: BLSP were reported breeding at the Coronado Islands in 1895 to 1902 (Anthony 1898, Grinnell & Daggett 1903). In 1976 and 1977, nests were first found in the CCI at Santa Barbara Island (Pitman & Speich 1976, Hunt *et al.* 1979). Colony attendance was also noted at Prince Island in 1991, when one bird was captured in a mist net (Carter *et al.* 1992). A single dead bird also was found at Seal Cove South Rock at San Clemente Island in 1991 and possible breeding was reported, although it also could have been dropped by an avian predator such as a Peregrine Falcon *Falco peregrinus* (Carter *et al.* 1992). BLSP also have been recorded occasionally in the past at San Clemente Island (Grinnell 1897, Holder 1910) and one was captured in a mist net at Seal Cove South Rock in 2015 (H.R. Carter, unpubl. data). Little suitable nesting habitat is available and breeding is not suspected. As noted above under LESP, the remains of a LESP or BLSP were found at Anacapa Island on 5 July 1912, but no nests were found; the carcass likely had been dropped by an avian predator (Wright & Snyder 1913).

APPENDIX 2

Fig. A: Crevice number 2 at Ship Rock, 21 April 2015 (photo by D.L. Whitworth).



Fig. B: Crevice number 4 (where Leach's Storm-Petrel vocalizations were recorded) at Ship Rock, 21 April 2015 (photo by D.L. Whitworth).



