List of Subjects in 47 CFR Part 73

Radio, Radio broadcasting.

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR Part 73 as follows:

PART 73—RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334, 336.

§ 73.202 [Amended]

2. Section 73.202(b), the Table of FM Allotments under Oregon, is amended by adding Maupin, Channel 244C2.

Andrew J. Rhodes,

Senior Counsel, Allocations, Audio Division, Media Bureau, Federal Communications Commission.

[FR Doc. E9–19872 Filed 8–18–09; 8:45 am]

BILLING CODE 6712–01–P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[DA 09–1795; MB Docket No. 09–146; RM–11553]

Television Broadcasting Services; Chicago, IL

AGENCY: Federal Communications Commission.

ACTION: Proposed rule.

SUMMARY: The Commission has before it a petition for rulemaking filed by WLS Television, Inc. (''WLS''), the licensee of station WLS–TV, DTV channel 7, Chicago, Illinois. WLS–TV requests the substitution of transition DTV channel 44 for its post-transition DTV channel 7 at Chicago.

DATES: Comments must be filed on or before September 3, 2009, and reply comments on or before September 14, 2009.

ADDRESSES: Federal Communications Commission, Office of the Secretary, 445 12th Street, SW., Washington, DC 20554. In addition to filing comments with the FCC, interested parties should serve counsel for petitioner as follows: Tom W. Davidson, Esq., Akin Gump Strauss Hauer & Feld, LLP, 1333 New Hampshire Ave., NW., Washington, DC 20026.

FOR FURTHER INFORMATION CONTACT: Adrienne Y. Denysyk, *adrienne.denysyk@fcc.gov,* Media Bureau, (202) 418–1600.

SUPPLEMENTARY INFORMATION: This is a synopsis of the Commission's Notice of Proposed Rule Making, MB Docket No. 09–146, adopted August 11, 2009, and released August 12, 2009. The full text of this document is available for public inspection and copying during normal business hours in the FCC's Reference Information Center at Portals II, CY–A257, 445 12th Street, SW., Washington, DC, 20554. This document will also be available via ECFS (*http://www.fcc.gov/cgb/ecfs/*). (Documents will be available electronically in ASCII, Word 97, and/or Adobe Acrobat.) This document may be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc., 445 12th Street, SW., Room CY–B402, Washington, DC 20554, telephone 1–800–478–3160 or via e-mail *http://www.BCPIWEB.com.* To request this document in accessible formats (computer diskettes, large print, audio recording, and Braille), send an e-mail to *fcc504@fcc.gov* or call the Commission's Consumer and Governmental Affairs Bureau at (202) 418–0530 (voice), (202) 418–0432 (TTY). This document does not contain proposed information collection requirements subject to the Paperwork Reduction Act of 1995, Public Law 104–13. In addition, therefore, it does not contain any proposed information collection burden ''for small business concerns with fewer than 25 employees,'' pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107–198, *see* 44 U.S.C. 3506(c)(4).

Provisions of the Regulatory Flexibility Act of 1980 do not apply to this proceeding. Members of the public should note that from the time a Notice of Proposed Rule Making is issued until the matter is no longer subject to Commission consideration or court review, all *ex parte* contacts are prohibited in Commission proceedings, such as this one, which involve channel allotments. See 47 CFR 1.1204(b) for rules governing permissible *ex parte* contacts.

For information regarding proper filing procedures for comments, see 47 CFR 1.415 and 1.420.

List of Subjects in 47 CFR Part 73

Television, Television broadcasting.

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR part 73 as follows:

PART 73—RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334, 336.

§ 73.622(i) [Amended]

2. Section 73.622(i), the Post-Transition Table of DTV Allotments under Illinois, is amended by adding DTV channel 44 and removing DTV channel 7 at Chicago.

Federal Communications Commission.

Clay C. Pendarvis,

Associate Chief, Video Division, Media Bureau.

[FR Doc. E9–19875 Filed 8–18–09; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FWS-R8-ES-2008-0049;1111 FY08 MO-B2]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Ashy Storm-Petrel as Threatened or Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12–month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12–month finding on a petition to list the ashy storm-petrel (*Oceanodroma homochroa*) as threatened or endangered, under the Endangered Species Act of 1973, as amended (Act). After a thorough review of all available scientific and commercial information, we find that listing the ashy storm-petrel is not warranted. We ask the public to continue to submit to us any new information concerning the status of, and threats to, this species. This information will help us to monitor and encourage the conservation of this species.

DATES: The finding announced in the document was made on August 19, 2009.

ADDRESSES: This finding is available on the Internet at *http://www.regulations.gov* and *http://www.fws.gov/arcata/*. Supporting documentation we used in preparing this finding is available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, 1655 Heindon Road, Arcata, CA 95521; telephone 707-822-7201; facsimile 707-822-8411. Please submit any new information, materials, comments, or questions concerning this finding to the above address.

FOR FURTHER INFORMATION CONTACT: Randy Brown, (Acting) Field

Supervisor, U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office (see **ADDRESSES** section). If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 1-800-877-8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*) requires that, for any petition to revise the Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific and commercial information that listing may be warranted, we make a finding within 12 months of the date of our receipt of the petition on whether the petitioned action is: (a) Not warranted, (b) warranted, or (c) warranted, but the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether any species is threatened or endangered, and expeditious progress is being made to add or remove qualified species from the Lists of Endangered and Threatened Wildlife and Plants. Such 12–month findings are to be published promptly in the **Federal Register**. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, and we must make a subsequent finding within 12 months.

Previous Federal Actions

On October 16, 2007, we received a petition, dated October 15, 2007, from the Center for Biological Diversity (CBD or petitioner), requesting that we list the ashy storm-petrel as a threatened or endangered species throughout its range and that we concurrently designate critical habitat (CBD 2007, pp. 1-51). In response to the petition, we sent a letter to the petitioner dated January 11, 2008, stating that we had secured funding and that we anticipated making an initial finding as to whether the petition contained substantial information indicating listing the ashy storm-petrel may be warranted in Fiscal Year 2008. We also concluded in our January 11, 2008, letter that emergency listing of the ashy storm-petrel was not warranted. On May 15, 2008, we published a 90–day petition finding (73 FR 28080) in which we concluded that the petition provided substantial information indicating that listing of the ashy storm-petrel may be warranted, and we initiated a status review. This notice constitutes the 12–month finding on the petition, dated October 15, 2007, to list the ashy storm-petrel as threatened or endangered.

Species Description

The ashy storm-petrel is a seabird species belonging to the order Procellariiformes, family Hydrobatidae. The ashy storm-petrel is one of five storm-petrel species (including fork-tailed (*Oceanodroma furcata*), Leach's (*O. leucorhoa*), black (*O. melania*), and least (*O. microsoma*) storm-petrels) that nest on islands along the west coast of North America (Harrison 1983, pp. 272-278). The ashy storm-petrel is a smoke-gray, medium-sized bird with long slender wings, a long forked tail, and webbed feet (Ainley 1995, p. 2).

Ashy storm-petrels have been confirmed to breed at 26 locations (on islands and offshore rocks) from Mendocino County, California, south to Todos Santos Islands, west of Ensenada, Baja California, Mexico (Carter *et al.* 1992, pp. 77-81; Ainley 1995, p. 2; Carter *et al.* 2006, p. 6; Carter *et al.* 2008a, p. 118). Greater than 95 percent of the species breeds in two population centers at the Farallon Islands and in the California Channel Islands (Sowls *et al.* 1980, p. 24; Ainley *et al.* 1990, p. 135; Carter *et al.* 1992, p. 86). Anacapa, San Miguel, Santa Cruz, Santa Rosa, San Clemente, San Nicholas, Santa Barbara, and Santa Catalina islands comprise the Channel Islands.

Ashy storm-petrels occur at their breeding colonies nearly year-round and occur in greater numbers from February through October (Ainley 1995, p. 5). Like other procellariids, ashy storm-petrels are highly philopatric; that is, birds usually return in consecutive years to the same breeding site or colony from which they were raised as chicks (James-Veitch 1970, p. 81; Warham 1990, p. 12). Ashy storm-petrels do not excavate burrows; rather, they nest in crevices of talus slopes, rock walls, sea caves, cliffs, and driftwood (James-Veitch 1970, pp. 87-88; Ainley *et al.* 1990, p. 147; McIver 2002, p. 1). The breeding season is protracted, and breeding activities (courtship, egg-laying, chick-rearing) at nesting locations occur from February through January of the following year (James-Veitch 1970, p. 71, Ainley *et al.* 1974, p. 301). During the pre-egg period, adult ashy storm-petrels begin to visit nesting sites in February (Ainley *et al.* 1974, p. 301; Ainley 1995, p. 5). Throughout the fledging period, the number of visiting adults declines (Ainley *et al.* 1974, p. 301). At Southeast Farallon Island, Ainley *et al.* (1974, p. 301) reported that immature (non-breeding) ashy storm-petrels visited the island from April through early July. The egg-laying period extends from late April to October, peaking in June and July (James-Veitch 1970, p. 243; Ainley *et al.* 1990, p. 148; McIver 2002, p. 17). Clutch size is one egg per year, and parents alternate incubation bouts during a 44–day incubation period (James-Veitch 1970, p. 244; Ainley 1995, p. 6). Less than about 4 percent of all eggs laid are replacement (or re-lay) eggs, laid after the failure of a first egg (Ainley *et al.* 1990, p. 148; McIver 2002, p. 18). Hatchlings are ''semi-precocial'' (James-Veitch 1970, p. 128). The term semi-precocial describes young that have characteristics of precocial young at hatching (open eyes, downy, capacity to leave the nest), but that remain at the nest and are cared for by parents until close to adult size (Sibley 2001, p. 573). Once hatched, the nestling is brooded for about 5 days, after which it remains alone in the nest site for an additional 75 to 85 days (James-Veitch 1970, pp. 141, 212; Ainley *et al.* 1990, p. 152). It is fed irregularly (1 to 3 nights on average) during brief, nocturnal visits by its parents from feeding areas at sea (James-Veitch 1970, pp. 180-208). Fledging occurs at night, from late August to January, and once they leave the nest, fledglings are independent of their parents (Ainley *et al.* 1974, p. 303; McIver 2002, p. 36). Peak fledging occurs in early to mid-October (McIver 2002, p. 18).

The nocturnal activity (return to and departure from nest) and crevice nesting of the ashy storm-petrel are believed to be adaptations to avoid predation by diurnal predators, such as western gulls (*Larus occidentalis*), peregrine falcons (*Falco peregrinus*), and common ravens (*Corvus corax*) (Ainley 1995, p. 5; McIver and Carter 2006, p. 3). Ashy storm-petrels are susceptible to predation at night by burrowing owls (*Athene cunicularia*) and barn owls (*Tyto alba*) (Ainley 1995, p. 5; McIver 2002, p. 30). Nesting in crevices and burrows on remote headlands, offshore rocks, and islands generally reduces predation of storm-petrels by mammalian predators (Warham 1990, p. 13). Known mammalian predators of ashy storm-petrels and their eggs include house mice (*Mus musculus*), deer mice (*Peromyscus maniculatus*), and island spotted skunks (*Spilogale gracilis amphiala*) (Ainley *et al.* 1990, p. 146; McIver 2002, pp. 40-41; McIver and Carter 2006, p. 3).

Obtaining direct population counts of ashy storm-petrels is difficult because the species often nests in deep, inaccessible crevices (Carter *et al.* 1992, p. 77; Sydeman *et al.* 1998a, p. 438). Techniques for estimating population size at breeding locations have included counting crevices and applying correction factors to account for burrow occupancy, mark and recapture using mist nests, and direct observation of nest sites. Estimates of breeding ashy storm-petrels for California have ranged from 5,187 (Sowls *et al.* 1980, p. 25) to 7,209 (Carter *et al.* 1992, p. I-87). Additional colony sites and larger ashy storm-petrel numbers have been found at several locations in the Channel Islands and along the mainland coast of California (Carter *et al.* 2008a, p. 119). Table 1 provides various estimates of numbers of breeding ashy storm-petrels at 26 locations in California and Baja California Norte, Mexico.

TABLE 1. ESTIMATES OF NUMBERS OF BREEDING ASHY STORM-PETRELS AT 26 LOCATIONS IN CALIFORNIA (UNITED STATES) AND BAJA CALIFORNIA NORTE (MEXICO).

	Location	Ownership or Management[a]	Estimated No. Breeding Birds	Source for Breeding Birds Estimates[b]
1	Bird Rock near Greenwood, Mendocino County	BLM	10	1,2,3
2	Caspar, near Point Cabrillo, Mendocino County	BLM	10	1,2,3
3	Bird Rock, Marin County	NPS	10	4
4	Stormy Stack, Marin County	NPS	10	4
5a	Southeast Farallon Island	FWS	4,000	5
5b	Southeast Farallon Island	FWS	3,402	6
5c	Southeast Farallon Island	FWS	1,990	6
6	Castle/Hurricane Colony Complex, Monterey County	BLM	60	7
7	Castle Rock, Santa Barbara County	USN/NPS	200	8
8	Prince Island	USN/NPS	1,154	1
9	Shipwreck Cave, Santa Cruz Island	TNC/NPS	20	9
10	Dry Sandy Beach Cave, Santa Cruz Island	TNC/NPS	80	10,11,12,13
11	Del Mar Rock, Santa Cruz Island	NPS	10	1
12	Cave of the Bird's Eggs, Santa Cruz Island	TNC/NPS	52	10,11,12,13
13	Diablo Rocks, Santa Cruz Island	NPS	20	8
14	Orizaba ("Sppit") Rock, Santa Cruz Island	NPS	40	10,11,12,13
15	Bat Cave, Santa Cruz Island	NPS	48	10,11,12,13
16	Cavern Point Cove Caves, Santa Cruz Island	NPS	0	10,11,12,13
17	Scorpion Rocks, Santa Cruz Island	NPS	140	1
18	Willows Anchorage Rocks, Santa Cruz Island	NPS	111	1
19	Gull Island	NPS	2	8
20	Santa Barbara Island	NPS	874	1
21	Sutil Island	NPS	586	1
22	Shag Rock	NPS	10	13
23	Ship Rock, Santa Catalina Island	BLM	2	14
24	Seal Cove Area, San Clemente Island	BLM	10	15
25	Islas Los Coronados, Mexico	MX	100	16
26	Islas Todos Santos, Mexico	MX	10	17
	Total, if using line 5a		7,569	
	Total, if using line 5b		6,971	
	Total, if using line 5c		5,559	

[a]Entity listed once if same for both ownership and management, as follows: Bureau of Land Management (BLM); Mexican Government (MX); National Park Service (NPS); The Nature Conservancy (TNC); U.S. Fish and Wildlife Service (FWS); and U.S. Navy (USN).

[b]Sources are as follows: 1-Carter *et al.* 1992; 2-Carter *et al.* 2008a; 3-Carter *et al. unpublished notes*; 4-Whitworth *et al.* 2002; 5-Ainley and Lewis 1974; 6-Sydeman *et al.* 1998a; 7-McChesney *et al.* 2000; 8-Hunt *et al.* 1979; 9-H. Carter, *unpublished data*; 10-McIver 2002; 11-McIver and Carter 2006; 12-Carter *et al.* 2007; 13-McIver *et al.* 2008; 14-FWS estimate, based on Carter *et al.* 2008a; 15-H. Carter and D. Whitworth, *unpublished data*; 16-Carter *et al.* 2006a; and 17-Carter *et al* 2006b.

Four thousand to six thousand ashy storm-petrels are usually observed in the fall in Monterey Bay, approximately 3 to 10 miles (mi) (5 to 16 kilometers (km)) offshore from the town of Moss Landing, California. As many as 10,000 ashy storm-petrels were estimated to be present in Monterey Bay in October 1977 and in September 2008 (Roberson 1985, p. 42; Shearwater Journeys 2008). However, both of these estimates were from non-standardized visual estimates.

Spear and Ainley (2007, p. 27) examined the seasonal at-sea distributions and abundance of storm-petrel species (including ashy storm-petrels) with generalized additive models, and estimated 4,207 and 7,287 birds during autumn and spring, respectively (95 percent confidence interval: 2,700 to 6,400 in autumn and 4,500 to 9,070 in spring) off of Sonoma to Monterey counties. Spear and Ainley (2007, p. 7) suggested that higher numbers of ashy storm-petrels may occur at Southeast Farallon Island, and other of the Farallon Islands, than have previously been reported. The total population of ashy storm-petrels (including breeders and non-breeders) has been estimated to be approximately 10,000 birds (Sowls *et al.* 1980, p. 24; Ainley 1995, p.1). Based on estimates at breeding locations and at-sea observations in Monterey Bay and off Sonoma to Monterey counties, we consider 7,000 to 10,000 birds to be a reasonable estimate of the total population size of ashy storm-petrels. However, based on other visual estimates mentioned above, the total population could be as high as 13,000 birds.

More ashy storm-petrels breed at Southeast Farallon Island than at any other single location (Sowls *et al.* 1980, p. 24; Carter *et al.* 1992, p. I-78). Assessing population size and trends has been done through capture-recapture techniques using audio playback and mist nets (see Ainley and Lewis 1974, p. 435; Sydeman *et al.* 1998a, p. 438). Ainley and Lewis (1974, pp. 432-435) estimated 4,000 breeding ashy storm-petrels at Southeast Farallon Island in years 1971 to 1972, from birds captured and recaptured in mist nets at night. Sydeman *et al.* (1998a, p. 438-442) re-analyzed data from Southeast Farallon Island for years 1971 and 1972 (Ainley and Lewis 1974) and included data from year 1992 to estimate 6,461 total ashy storm-petrels and 3,402 breeding ashy storm-petrels in 1971 to 1972, and 4,284 total ashy storm-petrels and 1,990 breeding ashy storm-petrels in 1992. Based on comparison of these data sets, Sydeman *et al.* (1998a, p. 442) suggested declines of 34 percent and 42 percent in the total population and breeding population of ashy storm-petrels, respectively, at Southeast Farallon Island. Sydeman *et al.* (1998a, pp. 445-446) reported that this decline occurred in prime storm-petrel nesting habitat, and suggested that this decline in population size at Southeast Farallon Island was due to, in part, an increase in the predation rate on ashy storm-petrel adults and sub-adults by western gulls and burrowing owls. We interpret these results cautiously because they are based on two data points: one from 1972 and one 20 years later from 1992. Sydeman *et al.* (1998b, pp. 1-74) conducted a population viability assessment of ashy storm-petrels at Southeast Farallon Island, quantitatively examining the effects of predation on population decrease of ashy storm-petrels. Sydeman *et al.* (1998b, pp. 1-2) estimated a 2.87 percent decline in the population of ashy storm-petrels from 1972 to 1992 and hypothesized that removal of western gull predation would produce a stable population. They also stated, given current population parameters and predation rates, the population of ashy storm-petrels faces a high probability of quasi-extinction within 50 years (Sydeman *et al.* 1998b, p. 2). Since 1992, capture-recapture of ashy storm-petrels at Southeast Farallon Island has continued and techniques have been further standardized (McChesney 2008, p. 4). Using data from 1999 to 2007, Warzybok and Bradley (2007, p. 17) describe analysis of capture-recapture data that shows increasing capture rates and increasing survival of ashy storm-petrels. Specifically, they report the mean standardized capture rate (number of birds caught per hour of effort) increased from approximately 13 birds per hour to 38 birds per hour between 1999 and 2005 but declined slightly in 2006. The mean capture rate for 2007 was 39 birds per hour (Warzybok and Bradley 2007, p. 17). The authors also note that there were a greater number of occupied nesting sites than in previous years. Although there are caveats associated with Warzybok and Bradley's (2007) analysis (See Factor C: Disease and Predation section below), their report represents the best available information to date and suggests an increasing population of ashy storm-petrels.

Research on reproductive success (or productivity, defined as number of fledged chicks per adult pair) of the ashy storm-petrel has been conducted only at Southeast Farallon Island (James-Veitch 1970, pp. 1-366; Ainley *et al.* 1990, pp. 128-162; Sydeman *et al.* 1998a, pp. 1-74; PRBO Conservation Science,) and Santa Cruz Island (McIver 2002, pp. 1-70; McIver and Carter 2006, pp. 1-6; Carter *et al.* 2007, pp. 1-32; McIver *et al.* 2008, pp. 1-23; McIver *et al.* 2009, pp. 1-30; McIver *et al.*, in preparation, pp. 1-23). Reported productivity values are presented in Table 2.

TABLE 2. AVERAGE VALUES FOR PRODUCTIVITY (FLEDGED CHICKS PER ADULT PAIR) OF ASHY STORM-PETRELS AT SOUTHEAST FARALLON ISLAND AND SANTA CRUZ ISLAND, CALIFORNIA, FOR SEVERAL STUDIES DURING 1964-1966 AND 1971-2008. SAMPLE SIZES ARE SHOWN IN PARENTHESES.

Location	Productivity	Years	Source
Southeast Farallon Island	0.42[a](n = 184)	1964-1966	James-Veitch (1970)
Southeast Farallon Island	0.69(n = 356)	1972-1983[b]	Ainley and Boekelheide (1990)
Southeast Farallon Island	0.74[d](n = 540)	1971-1992[b]	Sydeman *et al.* (1998b)
Southeast Farallon Island	0.54[c](n = 283)	1996-2007[e]	PRBO Conservation Science *unpublished data*; Warzybok and Bradley (2007)

TABLE 2. AVERAGE VALUES FOR PRODUCTIVITY (FLEDGED CHICKS PER ADULT PAIR) OF ASHY STORM-PETRELS AT SOUTHEAST FARALLON ISLAND AND SANTA CRUZ ISLAND, CALIFORNIA, FOR SEVERAL STUDIES DURING 1964-1966 AND 1971-2008. SAMPLE SIZES ARE SHOWN IN PARENTHESES.—Continued

Location	Productivity	Years	Source
Santa Cruz Island	0.55(*n* = 477)	1995-1998	McIver *et al. in preparation*, Table 4
Santa Cruz Island	0.65(*n* = 293)	2005-2008	McIver *et al. in preparation*, Table 4; McIver *et al.* (2009)

[a]Researcher disturbance (daily nest checks) negatively affected productivity.
[b]Excludes year 1977, when researcher disturbance negatively affected productivity.
[c]Sample sizes not provided for year 1996-2005, so annual sample size during this time period. assumed at 22 nests, based on average sample size in Sydeman *et al.* (1998b).
[d]Based on two data points.
[e]Based on yearly date.

No data are currently available regarding adult life span, survivorship, and age at first breeding for ashy storm-petrels (Ainley 1995, p. 8). However, like other procellariids, storm-petrels are long-lived (Warham 1996, p. 20). Some ashy storm-petrels reach 25 years old (Sydeman *et al.* 1998b, p. 7), and breeding adults over 20 years in age have been reported in the closely related Leach's storm-petrel (Morse and Bucheister 1977, p. 344). Mean age of first breeding in the Leach's storm-petrel has been reported at 5.9 years ± 1.3 years (Huntington *et al.* 1996, p. 19). Sydeman *et al.* (1998b, p. 7) concluded that 90 percent of adult ashy storm-petrels were capable of breeding at 6 years of age.

Marine Environment

Ashy storm-petrels are not as migratory as other storm-petrel species, foraging primarily in the California Current, from northern California to central Baja California, Mexico; the birds forage in areas of upwelling, seaward of the continental shelf, near islands and the coast (Ainley *et al.* 1974, p. 300; Briggs *et al.* 1987, p. 23; Mason *et al.* 2007, p. 60). The California Current flows along the west coast of North America, and like three other major, global, eastern boundary (along the eastern edges of oceanic gyres and the western edges of continents) currents, is characterized by the upwelling of cool, nutrient-rich waters, which results in increased productivity of the ocean (i.e., production of phytoplankton and zooplankton) in the region (Hickey 1993, pp. 19-70). The California Current extends about 190 mi (300 km) offshore from southern British Columbia, Canada, to Baja California, Mexico, and is comprised of a southward surface current, and a northward (poleward) undercurrent and surface countercurrents (Miller *et al.* 1999, p. 1; Dailey *et al.* 1993, pp. 8-10). Upwelling is an oceanographic phenomenon that involves wind-driven motion of dense, cooler, and usually nutrient-rich water towards the ocean surface, which replaces the warmer and usually nutrient-depleted surface water (Smith 1983, pp. 1-2). Coastal upwelling replenishes nutrients in the euphotic zone (zone of water where photosynthesis occurs), resulting in increased productivity in higher trophic levels (position within the food chain) (Batchelder *et al.* 2002, p. 37).

Crossin (1974, p. 176) observed ashy storm-petrels as far north as latitude 49° N, as far south as latitude 7° S, and approximately 300 mi (480 km) from shore near latitude 14° N. However, Spear and Ainley (2007, p. 7) disputed these observations and state that these observations likely represented misidentified dark-rumped Leach's storm-petrels. At-sea observations of ashy storm-petrels south of Islas San Benitos, Mexico (latitude 28° N) are unusual, and most observations of the species are off the coasts of California and Baja California Norte, Mexico (Briggs *et al.* 1987, p. 23; Ainley 1995, p. 2). Aerial and boat observations at-sea confirm that the species is associated with pelagic (offshore) waters along the slope of and just seaward of the Continental Shelf and the Monterey Submarine Canyon, and less often in neritic (nearshore) waters (Briggs *et al.* 1987, p. 23; Mason *et al.* 2007, pp. 56-60; Adams and Takekawa 2008, pp. 12-13). Ashy storm-petrels are not known to be associated with the deeper and warmer oceanic waters west of the California Current, unlike the closely-related Leach's storm-petrel (Ainley *et al.* 1974, pp. 299-300). Thus, the Service considers the at-sea geographic distribution (i.e., marine range) of the ashy storm-petrel to include waters off the western coast of North America, from latitude 42° N (approximately the California-Oregon State line) south to latitude 28° N (approximately Islas San Benitos, Mexico), and approximately 75 mi (120 km) out to sea from mainland and island coasts. The diet of ashy storm-petrels has not been extensively studied, but likely includes euphausiids (*Euphausia* spp., *Thysanoessa*), other crustaceans, larval lanternfish, unidentified fish, fish eggs, and squid (Warham 1990, p. 186; McChesney 1999, pers. com.; Adams and Takekawa 2008, p. 14).

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations at 50 CFR part 424 set forth procedures for adding species to the Federal List of Endangered and Threatened Wildlife. In making this finding, we summarize below information regarding the status and threats to this species in relation to the five factors in section 4(a)(1) of the Act. In our 90–day finding for this petition (73 FR 28080), we organized potential threats under the five factors according to how they were organized and described in the petition. In this 12–month finding, we analyze all of the potential threats described in the petition, but have reorganized them slightly under the factors that more appropriately categorize them. In making our 12–month finding, we considered and evaluated all scientific and commercial information available, including information received during and after the public comment period that ended July 14, 2008.

Factor A: The Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

Like most other procellariids, ashy storm-petrels feed mostly offshore or pelagically (Warham 1990, p. 10; Ainley 1995, p. 2) and return to land to breed at locations on islands and offshore rocks protected from mammalian predators (Warham 1990, p. 13; Ainley 1995, p. 3). Consequently, in this section, we describe various threats that may destroy, modify, or curtail the ashy storm-petrel's marine and terrestrial habitats and range. The petitioner asserts that the ashy storm-petrel is being or will be negatively affected by current and future climate change (specific effects: reduction in ocean productivity; ocean acidification; and sea level rise), tourism (specific effects: disturbance of habitats and nesting birds), and introduced grasses (CBD 2007, p. 15). The petitioner further asserts that the ashy storm-petrel's at-sea foraging habitat is being degraded by artificial (human-caused) light pollution, chemical and plastics pollution, and current and future oceanic changes related to climate change resulting from greenhouse gas emissions (CBD, p. 15); We addresspotential threats posed by artificial light pollution and chemical and plastics pollution under Factor E below. In this 12–month finding, we discuss under Factor A the following potential threats: (1) Climate change and associated effects—specifically, reduced productivity, ocean acidification, and sea-level rise; (2) introduced grasses; and (3) degradation of nesting habitats from tourism and military operations. The petitioner states that global warming will likely affect the ashy storm-petrel by causing warmer water and reduced upwelling, which reduces primary productivity in the California current system that would in turn decrease ashy storm-petrel breeding success and perhaps survival; global warming is leading to more intense El Niño events that could lead to ashy storm-petrel breeding failures; sea-level rise will eliminate important ashy storm-petrel breeding habitat in sea caves and off-shore rocks in the Channel Islands; and ocean acidification may lead to declines in the prey species upon which petrels depend (CBD 2007, p 2). We discuss first below the various climate-related factors affecting ashy storm-petrels.

El Niño and Reduced Productivity

The term El Niño-Southern Oscillation (hereafter, El Niño) is used to describe periodic basin-wide changes in air-sea interaction in the equatorial Pacific Ocean region, which result in increased sea-surface temperatures, reduced flow of eastern boundary currents, and reduced coastal upwelling (Norton and McLain 1994, pp. 16,019–16,030; Schwing *et al.* 2002, p. 461). La Niña events (sometimes called anti-El Niño or cold-water events) produce effects in the northeast Pacific Ocean that tend to be the reverse of those that occur during El Niño events; during La Niña events, strong upwelling-favorable winds and a shallow thermocline (zone of rapid temperature change with increased depth that typically separates warm and cold water) result in colder, more nutrient-rich waters than usual (Murphree and Reynolds 1995, p. 52; Oedekoven *et al.* 2001, p. 266). In addition to inter-annual climate events such as El Niño and La Niña, the mid-latitude Pacific Ocean experiences warm and cool phases that occur on decadal time scales (Mantua 2000, p. 2). The term ''Pacific Decadal Oscillation'' was coined to describe long-term climate variability in the Pacific Ocean, in which there are observed warm and cool phases, or ''regime shifts'' (Mantua *et al.* 1997, pp. 1069-1079).

The California Current system is affected by inter-annual (ENSO-related (El Niño/La Niña)) and inter-decadal (Pacific Decadal Oscillation) climatic processes. The petitioner cites Behrenfeld *et al.* (2006, pp. 752-755) to describe significant global declines in net primary production between years 1997 and 2005, attributed to reduced nutrient enhancement due to ocean surface warming (CBD 2007, p. 25). Specific to the marine range of the ashy storm-petrel, the petitioner states that the California Current System has experienced some of the most well-documented changes in ocean climate due to global warming (CBD 2007, p. 25). The petition cites several examples of changes in the California Current System, which it attributes to climate change, that all relate to reduced ocean productivity, including: reduction in zooplankton biomass and increased sea surface temperatures (Roemmich and McGowan 1995, pp. 1324-1326; Lynn *et al.* 1998, pp. 25-49); upwelling of warmer, nutrient-depleted waters, which leads to breeding failures, mortality, and population declines across trophic levels (Barber and Chavez 1983, pp. 1203-1210); delay in the onset of spring upwelling (Schwing *et al.* 2006, pp. 1-5); anomalously warm water, low nutrient levels, and low primary production (Thomas and Brickley 2006, pp. 1-5); reduced zooplankton biomass (Mackas *et al.* 2006, pp. 1-7); unprecedented seabird breeding failures (Sydeman *et al.* 2006, pp. 1-5); and anomalously low recruitment of rocky intertidal organisms (Barth *et al.* 2007, pp. 3719-3724). Specific changes in the California Current that may negatively affect the ashy storm-petrel are discussed below.

Roemmich and McGowan (1995, pp. 1324-1326) described 43 years (from 1951 to 1993) of observations off the southern California coast. They reported that zooplankton had decreased by 80 percent, and that surface temperatures taken during transects off Point Conception and Orange County (approximately) warmed by an average of 2.2 °F (1.2 °C) and 2.3 °F (1.6 °C), respectively, during this period. They suggested that the zooplankton decline was directly related to and caused by the observed warming (Roemmich and McGowan 1995, p. 1325). The petitioner cited Schwing *et al.* (2006, pp. 1-5), Barth *et al.* (2007, pp. 3719-3724), and Sydeman *et al.* (2006, pp. 1-5) to describe a delay in the onset of spring upwelling in the northern California Current that resulted in breeding failures of Cassin's auklets (*Ptychoramphus aleuticus*) at Southeast Farallon Island, and at Triangle Island, British Columbia, in 2005 (CBD 2007, p. 25). At Southeast Farallon Island, Cassin's auklets also failed to breed in 2006 as well, likely as a result of warm-water conditions, reduced upwelling, and reduced availability of krill (Warzybok *et al.* 2006, pp. 12-14).

At Southeast Farallon Island, productivity (chicks fledged per breeding pair) of ashy storm-petrels was 0.56 in 2005, and 0.48 in 2006 (Warzybok *et al.* 2006, p. 7). At Santa Cruz Island, productivity of ashy storm-petrels was 0.58 in 2005, and 0.68 in 2006 (McIver *et al.* in preparation, tables 2-4). Sydeman *et al.* (2006, p. 1) reported that euphausiid crustacean (krill) biomass in the Gulf of the Farallones was reduced in 2005, but remained high south of Point Conception. To successfully raise a chick, an adult storm-petrel must obtain enough food for itself, plus one-half the food requirements of the chick, plus food to fuel the metabolic costs of transporting food to the nesting location (Quinlan 1979, p. 103). Thus, if food was less available to ashy storm-petrels foraging north of Point Conception (presumably, Southeast Farallon Island breeders) in 2005 and 2006, adverse affects may have appeared during the chick stage, and this could explain (in part) reduced breeding success at Southeast Farallon Island in 2006.

Like Cassin's auklets, ashy storm-petrels feed on krill. However, unlike Cassin's auklets, ashy storm-petrels have more extended incubation and chick-rearing periods (per egg-laying effort), and feed over a wider geographic area; thus, they are likely more able to exploit similar food resources when these resources are reduced or more patchily distributed. As stated earlier, Cassin's auklets failed to breed in 2005 and 2006, in contrast to ashy storm-petrels, which did breed. Additionally, Ainley (1990b, pp. 357-359) reported that ashy storm-petrels showed the lowest inter-annual variability in productivity of any species breeding at Southeast Farallon Island, for the years 1971 to 1983. Ashy storm-petrel productivity was 0.64 and 0.69 in 1972 (n = 36) and 1973 (n = 35), respectively; 0.81 in 1976 (n = 37); and 0.75 and 0.67 in 1982 (n = 28) and 1983 (n = 18), respectively (Ainley and Boekelheide 1990, p. 392). This is of importance because during this time period, El Niño events occurred in 1972-73, 1976, and 1982-83 (Ainley 1990a, p. 36). Ainley (1990b, p. 371) reported that breeding by other seabirds at Southeast Farallon Island was poor to nonexistent in 1973, 1976, 1978, 1982, and 1983. As noted above, ashy storm-petrels were the exception to this observation; they bred in all years of the study, and no clear correlation between warm-water years and reduced reproductive success (productivity) was evident for this species (Ainley and Boekelheide 1990, p. 392). The only response to El Niño conditions that may be evident are smaller numbers of ashy storm-petrels breeding and delayed egglaying (later in the season than in other years) (Ainley and Boekelheide 1990, p. 392; Ainley *et al* 1990, pp. 149-150). However, since regular annual monitoring of nesting activities began at Southeast Farallon Island (in 1971) and at Santa Cruz Island (in 1994), researchers have observed ashy storm-petrels (on a population level) breeding each year. In research conducted in 1995-97 and 2005-07, McIver *et al.* (*in preparation*, p. 10) report that reproductive success (productivity) of ashy storm-petrels at Santa Cruz Island did not appear to be negatively affected by El Niño conditions (although timing of breeding was later in 1998, an El Niño year), and no clear relationship between oceanographic conditions in southern California and reproductive success of ashy storm-petrels was observed. As presented above, this is supported by data from research at Southeast Farallon Island. Productivity of ashy storm-petrels at Southeast Farallon Island declined from the late 1980s to the mid-1990s (Sydeman *et al.* 2001, p. 315; CBD 2007, p. 8; Warzybok and Bradley 2007, p. 7). However, more recent data indicate that this decline in productivity has not continued. Warzybok and Bradley (2007, p. 17) describe an analysis of capture-recapture data that shows increasing capture rates and increasing survival of ashy storm-petrels on Southeast Farallon Island. Based on observed annual breeding and reproductive success values of ashy storm-petrels during El Niño events, and the low inter-annual variability in reproductive success as reported by Ainley and Boekelheide (1990, p. 392) and McIver (2002, p. 29), we conclude there is no clear relationship between reduced productivity of phytoplankton and zooplankton in the California Current due to El Niño events and reproductive success of ashy storm-petrels.

As enumerated above, the petition cited several examples of changes in the California Current System, revolving around ocean productivity, which the petition claims has had an adverse effect on ashy storm-petrels. Based on our review of the available information, we found that some species of seabirds have experienced breeding failures in certain years, which can be linked to El Niño events, warmer water, or lower primary productivity. However, productivity of the ashy storm-petrel over approximately the past 40 years does not show breeding failures in those same years. This is likely due to the species' ability to exploit a wider range of resources than other seabirds. Based on the species' response to El Niño events, we conclude the ashy storm-petrel is not likely to be adversely affected by potentially lower ocean productivity due to long-term ocean warming. In 2006, when Cassin's auklets failed to breed at Southeast Farallon Island likely as a result of warm-water conditions, reduced upwelling, and reduced availability of krill or a delay in the onset of spring upwelling, ashy storm-petrels did breed but had slightly lower productivity. Based on this information, we do not consider the delay in the onset of spring upwelling to be a threat to the species. Therefore, based on the best scientific information available to the Service regarding the effects of climate change, including the effects of El Niño and changes in the California Current on ocean productivity, we do not consider this to be a significant threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Climate Change – Ocean Acidification

The petitioner claims that ocean acidification may eventually have detrimental impacts on the ashy storm-petrel's crustacean prey species (e.g., *Euphausia pacifica, Thysannoessa spinifera*) that may be impaired in building their exoskeletons in the coming decades (CBD 2007, p. 29). The petitioner cites Orr *et al.* (2005, p. 682) that mid-latitude waters, where the California Current Ecosystem is located, are experiencing the largest decreases in surface carbonate ion concentrations.

The chemical processes behind ocean acidification are well known. The presence of inorganic carbon in the ocean is largely responsible for controlling the pH (the measure of acidity) of seawater, and dissolved inorganic carbon in seawater exists in three major forms, including a bicarbonate ion, carbonate ion, and aqueous carbon dioxide (Fabry *et al.* 2008, pp. 414-415). Human industrial and land use activities are resulting in increased atmospheric concentrations of carbon dioxide (Feely *et al.* 2004, p. 362); much carbon dioxide is absorbed by the oceans (Caldiera and Wickett 2003, p. 365; Sabine *et al.* 2004, p. 370). When carbon dioxide dissolves in water, carbonic acid is formed, most of which quickly dissociates into a hydrogen ion and a bicarbonate ion; the hydrogen ion can further react with a carbonate ion to form bicarbonate (Fabry *et al.* 2008, p. 415). The effects of increased absorption of carbon dioxide by the oceans have been given the term ''ocean acidification'' and include an increase in concentrations of carbonic acid, bicarbonate, and hydrogen ions; a decrease in concentration of carbonate; and a reduction in the pH level in seawater (Caldiera and Wickett 2003, p. 365; Royal Society *et al.* 2005, p.16; Fabry *et al.* 2008, p. 415). Pure water has a pH of 7; solutions below pH 7 are acidic, and solutions above pH 7 are alkaline, or basic (summarized in Hardt and Safina 2008, p. 1). Oceans are slightly alkaline, with a pH of 8.1 (at latitude 30°N, approximately; Caldiera and Wickett 2005, p. 5). Measurements of surface ocean pH in 2005 were 0.1 unit lower than preindustrial values (prior to the 1850s) and could become 0.3 to 0.4 units lower by the end of the 21st century (Caldiera and Wickett 2005, p. 5). Marine organisms that produce shells, such as corals, mollusks, echinoderms, and crustaceans, require carbonate ions to produce their calcium carbonate shells and skeletons (Orr *et al.* 2005, p. 681; Fabry *et al.* 2008, p. 415). There are three mineral forms of calcium carbonate (magnesium-calcite, aragonite, and calcite), and each has different tendencies to dissolve (solubility) in seawater (summarized in Hardt and Safina 2008, p. 2). The reaction of excess carbon dioxide with seawater reduces the availability of carbonate ions necessary for shell and skeleton formation for these organisms (Fabry *et al.* 2008, p. 415). Generally, oceanic surface waters are saturated with calcium carbonate, deeper waters are under-saturated, and the depth where waters transition from saturated to unsaturated is called the saturation horizon (summarized in Hardt and Safina 2008, p. 2). A reduction in carbonate ions causes all forms of calcium carbonate to dissolve at shallower depths, and causes a reduction in the rate at which marine organisms can produce calcium carbonate (summarized in Hardt and Safina 2008, p. 2). In other words, once formed, calcium carbonate will dissolve back into the water unless the surrounding seawater contains sufficiently high concentrations of carbonate ions (Royal Society *et al.* 2005, p. 10).

The major planktonic calcium carbonate producers in the ocean are coccolithophores (single-celled phytoplankton), foraminifera (amoeboid protists), and pteropods (marine mollusks) (Fabry *et al.* 2008, p. 417). Marine organisms act as a ''biological pump,'' removing carbon dioxide and nutrients from the surface ocean and transferring these elements into the deeper ocean and ocean bottom (Zondervan *et al.* 2001, p. 507; Chen *et al.* 2004, p.18).

Feely *et al.* (2008, pp. 1490-1492) conducted hydrographic surveys along the continental shelf of North America, and found evidence for undersaturated (with respect to aragonite) and low pH (less than 7.75) waters at mid-shelf depths of approximately 131 to 394 feet (ft) (40 to 120 meters (m)) from about middle California (latitude 37° N, approximately) to Baja California Sur, Mexico (latitude 26° N, approximately). Feely *et al.* (2008, p. 1492) reported that much of the corrosive character of these waters is natural as the result of respiration processes at intermediate depths below the euphotic zone. Feely *et al.* (2008, p. 1492) cautioned that the California coastal region continues to accumulate anthropogenic carbon dioxide, and concluded that seasonal upwelling processes enhance the advancement of the corrosive deep water into wide regions of the North American continental shelf. Feely *et al.* (2008, p. 1492) further reported that little was known about how intermittent exposure to acidified water might affect the development of calcifying, or shell building, organisms in this region.

The ecological effects of changing ocean carbonate chemistry are uncertain due to complexities of marine ecosystems, and research to date has focused on the impact of acidification on calcifying organisms (Antarctic Climate & Ecosystems Cooperative Research Centre 2008, p. 7). Although the chemical processes associated with ocean acidification and the biological processes involving the transport of carbon in the oceans have been studied and described in detail, little research has been conducted to assess the response of many zooplankton populations, including euphausiids (upon which ashy storm-petrels likely feed), to ocean acidification (Fabry *et al.* 2008, p. 426). However, the Service is aware of one study (Yamada and Ikeda 1999, pp. 62-67) that experimentally tested the acute (lethal) effects of lowered pH levels upon *Euphausia pacifica*, a species of krill that occurs in the northern Pacific Ocean and is a known prey item of ashy storm-petrels. Observing 5 juveniles and 20 nauplii (the free-swimming first stage of the larva) of *Euphausia pacifica*, Yamada and Ikeda (1999, pp. 65) found increased mortality with increased exposure time and decreased pH (less than 6.9). Based on their data, Yamada and Ikeda (1999, p. 66) also suggested that the ability to tolerate lowered pH may be highly variable between and possibly within species, as in the case of nauplii and juveniles of *Euphausia pacifica*. Yamada and Ikeda (1999, p. 66) suggested that information about pH levels that induce chronic (sublethal) effects would be more appropriate to estimate the long-term consequences for a given zooplankton population, in that zooplankton may survive exposure to lower pH levels but may be unable to produce normal offspring. The Service is also aware of research currently being conducted to study the possible effects of ocean acidification on euphausiids in waters near Antarctica (see Rowbotham 2008, p. 1), but this research has just begun and data are currently not available (T. Berli, personal communication 2008).

As stated in the Species Description section, the diet of ashy storm-petrels has not been extensively studied; however, like other species of storm-petrels, ashy storm-petrels likely feed on euphausiids, juvenile lanternfish, fish eggs, and other small fish that occur at the surface of the ocean. Our review of the available information did not reveal any information regarding diet studies or measurements of chick growth and weight that indicate that ashy storm-petrels are eating fewer euphausiids or are providing less food to their chicks. Additionally, our review of the available information did not find any research indicating that ocean acidification is causing acute or chronic effects to euphausiid populations that occur in the California Current, or any other species of krill that occur in the California Current, on which ashy storm-petrels feed. Although the processes and potential effects of ocean acidification on biological food webs have been described, and experimental research on *Euphausia pacifica* has tested lethal effects of exposure to low pH, our review of the available information did not reveal any evidence that demonstrates a direct link between ocean acidification and reduced abundance and survival of prey items on which ashy storm-petrels depend. Additionally, Ainley (1990b, p. 371) reported that breeding by other seabirds at Southeast Farallon Island was poor to nonexistent during warm-water years (El Niño events). However, ashy storm-petrels bred in years that other seabird species did not (Ainley and Boekelheide 1990, p. 392), which is an indication that the ashy storm-petrel is less affected by changes in ocean productivity than other species. Therefore, based on our review of the available information, we conclude that the potential effects of ocean acidification are not currently a significant threat to ashy storm-petrels based on the uncertainty of the ecological effects of changing ocean carbonate chemistry.

Published research and oceanographic modeling does show that oceans are acidifying, and we recognize that ashy storm-petrels may be susceptible to changes in the oceans' chemistry in the future. However, based on the best scientific information available to the Service regarding ocean acidification, at this time we do not consider ocean acidification to be a significant threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Climate Change – Sea Level Rise

The petitioner claims that climate change will cause rises in the elevation of the oceans that will have negative consequences for ashy storm-petrels by eliminating (presumably, by inundation and submersion by seawater) important habitat in sea caves and offshore rocks in the California Channel Islands (CBD 2007, p. 28). Sea levels along the California coast are projected to rise approximately 1 ft (0.3 m) by 2050 and approximately 3 ft (0.9 m) by 2100 (California Coastal Commission 2001, pp. 14-15; Cayan *et al.* 2006, p. S71). Future sea levels along the coast of California will likely depend upon (in part): future changes in global temperatures; lag time between atmospheric changes and oceanic reactions; thermal expansion of ocean water; effects of atmospheric temperature changes on Antarctica; melting of Greenland ice and other glaciers; and local subsidence and uplift of coastal areas (California Coastal Commission 2001, p. 12). Gradual sea level rises progressively worsen the impacts of high tides (through erosion and submersion), surge, and waves resulting from storms (Cayan *et al.* 2008, pp. S57-S58).

We reviewed topographic maps and information provided in Sowls *et al.* (1980), Bunnell (1988), and Carter *et al.* (1992; 2006a; 2006b) to estimate the range of elevations above sea level of suitable ashy storm-petrel habitat at each of the 26 known breeding locations (Table 3).

TABLE 3. ESTIMATED RANGE OF ELEVATION ABOVE SEA LEVEL (ASL) IN FEET (FT) AND METERS (M) OF KNOWN NESTING HABITAT OF ASHY STORM-PETRELS.

Location Number	Breeding Location Name	Elevation ASL
1	Bird Rock near Greenwood, Mendocino County	10–40 ft (3–12 m)
2	Caspar, near Point Cabrillo, Mendocino County	10–40 ft (3–12 m)
3	Bird Rock, Marin County	10–40 ft (3–12 m)
4	Stormy Stack, Marin County	10–50 ft (3–15 m)
5	Southeast Farallon Island	10–330 ft (3–100 m)
6	Castle/Hurricane Colony Complex, Monterey County	10–100 ft (3–30 m)
7	Castle Rock, Santa Barbara County	20–80 ft (6–24 m)
8	Prince Island	20–300 ft (6–91 m)
9	Shipwreck Cave, Santa Cruz Island	5–15 ft (1.5–5 m)
10	Dry Sandy Beach Cave, Santa Cruz Island	5–15 ft (1.5–5 m)
11	Del Mar Rock, Santa Cruz Island	5–20 ft (1.5–6 m)
12	Cave of the Birds Eggs, Santa Cruz Island	5–10 ft (1.5–3 m)
13	Diablo Rocks, Santa Cruz Island	10–40 ft (3–12 m)
14	Orizaba Rock, Santa Cruz Island	10–30 ft (3–9 m)
15	Bat Cave, Santa Cruz Island	5–20 ft (1.5–6 m)
16	Cavern Point Cove Caves, Santa Cruz Island	0–10 ft (0–3 m)
17	Scorpion Rocks, Santa Cruz Island	10–40 ft (3–12 m)
18	Willow Anchorage Rocks, Santa Cruz Island	10–40 ft (3–12 m)
19	Gull Island, Santa Cruz Island	10–100 ft (3–30 m)
20	Santa Barbara Island	10–600 ft (3–183 m)
21	Sutil Island	10–250 ft (3–76 m)
22	Shag Rock	10–50 ft (3–15 m)
23	Ship Rock, Santa Catalina Island	5-20 ft (1.5–6 m)
24	Seal Cove Area, San Clemente Island	10-50 ft (3–15 m)
25	Islas Los Coronados, Mexico	10-100 ft (3–30 m)
26	Islas Todos Santos, Mexico	10-100 ft (3–30 m)

The nesting habitat at the majority of ashy storm-petrel breeding locations will likely not be affected by the sea level rise projected for California by 2100 (Table 3). Some nesting habitat at only one location at Cavern Point Cove Caves, Santa Cruz Island, would likely be submerged if projected sea level rises of 1 ft (0.3 m) by 2050 occur; much of the nesting habitat at this location would likely be submerged if the sea level rises 3 ft (0.9 m) by year 2100. Prior to the mortality event in 2008 at this location (see Factor C), Cavern Point Cove Caves had approximately 40 breeding birds annually. Some habitat at other cave locations on Santa Cruz Island may be susceptible to submersion by seawater. For example, on Santa Cruz Island in November 2008, McIver *et al.* (2009, p. 6) reported flooding by ocean water in a sea cave that likely killed one storm-petrel chick. Despite this unusual event, the majority of the nesting habitat in the sea caves at Santa Cruz Island occurs greater than 3 ft (1 m) above current sea level, and would not likely be submerged during breeding season months (April through November) within the next 40 to 50 years. Winter storm surges periodically wash all of the sea caves at Santa Cruz Island, but these storm events likely do not negatively affect ashy storm-petrels, since most ashy storm-petrels are not attending the colonies during winter months (Ainley 1995, p. 5). In fact, past winter storms have benefited ashy storm-petrels at Santa Cruz Island by creating nesting habitat; approximately 25 percent of ashy storm-petrel nest sites in Bat Cave occur among accumulated driftwood debris (both human-made and natural) that has washed into the cave during past winter storm events.

Based on information available to the Service regarding elevations (above current sea level) of breeding locations of ashy storm-petrels, and projected estimates of sea level rise along the west coast of North America during the 21st century, we conclude that a small portion of the total population of ashy storm-petrels (approximately 0.8 percent) could be negatively affected by rising sea levels by 2050. Therefore, based on the best scientific information available to the Service regarding climate change-induced sea level rise, at this time we do not consider this to be a significant threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Changes in Terrestrial Breeding Habitat

Introduced Grasses

The petitioner asserts that the ashy storm-petrel's island breeding habitats are being modified and degraded by introduced species and specifically, that introduced grasses have increased at Southeast Farallon Island, causing some nesting areas to be unusable for ashy storm-petrels (CBD 2007, p. 30). In addition, the petitioner claims that introduced grasses are widespread at all ashy storm-petrel colonies and that their effects have not been evaluated (CBD 2007, p. 30). Ainley (1995, p. 9) describes introduced grasses as a factor potentially limiting the amount of available nesting habitat for ashy storm-petrels at Southeast Farallon Island. Ainley and Hyrenbach (*in press*, p. 12) report that introduced grasses have spread, thickened, and grown among the talus slopes at Southeast Farallon Island, and suggest that grasses likely limit access to cavities by ashy storm-petrels, which do not excavate nesting burrows and instead rely upon available nesting crevices. However, the petitioner did not provide, nor did our review of the available information reveal, specific information that quantifies the amount of suitable nesting habitat at Southeast Farallon Island, or other breeding locations, that may be unavailable to ashy storm-petrels because of introduced grasses. In addition, our review of the available information found no information to indicate that introduced grasses are widespread at all breeding locations. For example, grasses do not occur in sea caves or on most offshore rocks where ashy storm-petrels nest.

Introduced grasses may occur in proximity to ashy storm-petrel nest sites on Southeast Farallon Island and on Santa Barbara Island. Based on population estimates for these areas presented in Table 1, approximately 51 to 64 percent of ashy storm-petrels breed at these locations; however, we are not aware of any evidence through direct observation or vegetation surveys that indicates that introduced grasses prevent significant numbers of ashy storm-petrels from nesting. Grasses are widespread on Santa Barbara Island, where the major plant communities include island grassland, coastal sage scrub, maritime desert scrub, and coastal bluff scrub (Schoenherr *et al.* 2003, p. 349). However, ashy storm-petrels at Santa Barbara Island likely nest in crevices that occur in steep cliffs, where grasses are less common (Carter *et al.* 1992, p. I-81). Therefore, based on the best scientific information available to the Service regarding the threat of introduced grasses, at this time we do not consider this to be a significant threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Human Degradation of Nesting Habitats

The petitioner states that human disturbance and degradation of nesting habitats through tourism and military activities threaten the continued existence of the ashy storm-petrel (CBD 2007, p. 35). Regarding tourism, most breeding locations occur on federally owned or managed lands that are generally inaccessible to visitation by the public. Southeast Farallon Island contains approximately 36 to 53 percent of the total ashy storm-petrel population and has low human visitation by the Service's Refuge staff but is closed to the general public. Due to steep topography and difficult ocean and landing conditions, breeding locations on islands and offshore rocks other than Southeast Farallon Island are generally inaccessible to tourists, and our review of the available information has not revealed specific information indicating that ashy storm-petrel nesting habitats on islands, offshore rocks, and islets are being degraded by human visitation. Sea caves on Santa Cruz Island are susceptible to visitation by tourists (e.g., sea kayakers) (McIver 2002, p. 53; McIver *et al.* 2008, pp. 7-8). However, the U.S. National Park Service, Channel Islands National Park (Park) has closed two sea caves to the public, and in spring 2009, installed signs (inconspicuous from the water) within the entrances of Bat Cave and Cavern Point Cove Caves informing tourists that the caves contain nesting seabirds and are closed to visitation by the public (W. McIver, personal observation). Although there is direct evidence that tourists have occasionally visited sea caves at Santa Cruz Island where ashy storm-petrels nest (McIver *et al.* 2008, p. 5; McIver *et al.* 2009, pp. 7-8), the available information does not indicate adverse impacts of tourism upon ashy storm-petrels, such as dead birds, broken eggs, or degraded or modified nesting habitats. Due to observed lower hatching success at Cavern Point Cove Caves, in comparison to other locations at Santa Cruz Island (McIver 2002, p. 24), we cannot discount the possibility that visitation by tourists may have resulted in disturbance to and abandonment of some nests of ashy storm-petrels at this location. However, because most ashy storm-petrel breeding locations are generally inaccessible to tourists, we find it unlikely that human visitation has caused large-scale disturbance to ashy storm-petrels and subsequent abandonment of nesting efforts. Thus, based on land ownership and restricted human activities at ashy storm-petrel breeding locations on Southeast Farallon Island and on the Channel Islands, we find human tourism is currently not a substantial threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Within the range of the ashy storm-petrel, military activities only occur on San Clemente Island, which is one of the Channel Islands. San Clemente Island is owned and managed by the Department of the Navy, and it is estimated that at least 10 ashy storm-petrels breed there (H. Carter and D. Whitworth,). Ashy storm-petrels are known to breed at Seal Cove Rocks (Carter *et al.* 2008a, p. 119), off the island's west side, and may breed on offshore rocks off China Point, and at or near Mosquito Cove (Hering 2008, p.4). Seal Cove Rocks occur outside of any current training areas (Hering 2005, p. 5). Offshore rocks near China Point do occur within the Shore Bombardment Area (SHOBA); however, these rocks are not targeted by bombardment activities, and ashy storm-petrels have not been confirmed as breeding there (Hering 2008, p. 5). Mosquito Cove is also within the boundaries of SHOBA, but occurs outside the impact areas (Hering 2008, p. 5). Carter *et al.* (2008c, pp.12-13) report that portions of Prince Island were used by the U.S. Navy as a target for aerial bombing and missile testing from the late 1940s to the early 1970s. Carter *et al.* (2008c, p.13) speculated that effects included: some seabirds probably were killed by explosions; loss of breeding habitats for burrow- and crevice-nesting seabirds likely occurred due to explosions; and periodic human disturbance of seabirds likely occurred from military personnel. However, our review of the available information did not reveal any specific impacts to ashy storm-petrels at Prince Island as a result of these activities, and these activities have not occurred at this breeding location for more than 35 years. Therefore, because only a small percentage (approximately 0.1 percent) of the entire population of ashy storm-petrels nests on San Clemente Island, current military activities at San Clemente Island likely do not affect ashy storm-petrel nesting areas there, and because military activities no longer occur at Prince Island, we conclude that military activities do not pose a substantial threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Human visitation at Southeast Farallon Island is low, and there is no evidence to suggest degradation of nesting habitats there. At the Channel Islands, human visitation is greater near breeding habitat, but the National Park Service has taken steps to close several sea caves where ashy storm-petrels breed. Additionally, there is no direct evidence of human impacts to ashy storm-petrels or their breeding habitat at these locations. Within the range of the ashy storm-petrel, military activities only occur currently on San Clemente Island but are not targeted at breeding or nesting areas. Therefore, based on the best scientific information available to the Service, at this time we conclude that human degradation of nesting habitats by tourism and military activities is not a significant threat to the ashy storm-petrel at Southeast Farallon Island, at the Channel Islands, or rangewide.

Summary of Factor A

While there is some evidence to suggest the timing of ashy storm-petrel egg laying may be delayed as a result of El Niño events, and that fewer numbers of ashy storm-petrels may attempt to breed during El Niño years, these results do not appear significant, and we have no information to suggest that El Niño events otherwise significantly affect ashy storm-petrel reproductive success or productivity, unlike in other sea birds. Additionally, based on the species' response to El Niño events, we conclude the ashy storm-petrel is not likely to be adversely affected by potentially lower ocean productivity due to long-term ocean warming. Based on our review of current research, there is demonstrated evidence of ongoing ocean acidification; however, current research does not demonstrate a direct link between ocean acidification and reduced abundance and survival of prey items on which ashy storm-petrels depend, nor does current research indicate that reproductive success of ashy storm-petrels is affected by ocean acidification. Projected changes in sea levels along the west coast of North America (by year 2050) may submerge nesting habitat at Cavern Point Cove Caves in the California Channel Islands, which could affect approximately 0.8 percent of all ashy storm-petrels, but the majority of currently available nesting habitat in California will not be affected by the sea level rise projected in California during the 21st century. The Service finds that there is no specific evidence indicating that the presence of introduced grasses at Southeast Farallon Island, the Channel Islands, or other breeding locations prevents ashy storm-petrels from breeding. Although there is evidence of some human visitation to sea caves on Santa Cruz Island, modification or degradation of nesting habitat by tourism activities is not a significant threat to the ashy storm-petrel because of protective measures taken by the National Park Service and the lack of evidence of human disturbance in sea caves on the Channel Islands. Additionally, military activities are not a significant threat to the species because military activities do not occur at known breeding areas. Therefore, based on the best available scientific information, we conclude that the ashy storm-petrel is not threatened by the present or threatened destruction, modification, or curtailment of its habitat or range at Southeast Farallon Island, at the Channel Islands, or rangewide.

Factor B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The petitioner stated that research activities may impact ashy storm-petrels, but also stated there was no evidence that this impact has had significant negative consequences on studied populations (CBD 2007, p. 30). Our review of the available information does not indicate that research activities threaten ashy storm-petrels across all or a significant portion of their range.

Commercial Purposes

The ashy storm-petrel is not a commercially exploited or used species. We are not aware of any information that indicates that overutilization for commercial purposes threatens the ashy storm-petrel across all or in any portion of its range.

Recreational Purposes

Ashy storm-petrels are a species of interest during pelagic bird-watching trips off the coast of California. Ashy storm-petrels are generally wary of and avoid boats, including boats with birdwatchers, and it is highly unlikely that ashy storm-petrels are negatively affected by these recreational activities. Tourism at sea caves (see Factor A) located on Santa Cruz Island is a recreational activity that could affect ashy storm-petrels. However, as stated above, there is no evidence to suggest such recreational activities are significantly affecting the species. We are not aware of any information that indicates that overutilization for recreational purposes threatens the ashy storm-petrel across all or any portion of its range.

Scientific and Educational Purposes

The Service is aware of 220 ashy storm-petrel eggs and 355 study skins (includes study skins, skeletons, round skins) that have been collected and salvaged from 1885 to 2004 for scientific archival purposes. The Service obtained data from individual institutions and records held in the following institutions and accessed through the ORNIS data portal (*http://ornisnet.org*) on September 23, 2008 (Table 4).

TABLE 4. INSTITUTIONS THAT POSSESS COLLECTED SKINS OR EGGS OF THE ASHY STORM-PETREL.

Institution or Entity	Number of skins	Number of eggs
California Academy of Sciences, San Francisco, CA	181	70
Cornell University Museum of Vertebrates, Ithaca, NY	2	0
Delaware Museum of Natural History, Wilmington, DE	1	0
Field Museum, Chicago, IL	10	0
Harvard University Museum of Comparative Zoology, Cambridge, MA	6	0
Humboldt State University Natural History Museum, Arcata, CA	2	2
Los Angeles County Museum of Natural History, Los Angeles, CA	18	0
Museum of Vertebrate Zoology, Berkeley, CA	39	20
National Museum of Natural History, Washington, DC	32	6
Santa Barbara Museum of Natural History, Santa Barbara, CA	13	5
San Diego Natural History Museum, San Diego, CA	31	0
Slater Museum of Natural History, Tacoma, WA	3	3
University of Arizona Museum of Natural History, Tucson, AZ	9	0
University of California at Los Angeles - Dickey Collection, Los Angeles, CA	3	0
University of Kansas Natural History Museum and Biodiversity Research Center, Lawrence, KS	1	0
University of Washington - Burke Museum of Natural History	3	2
Western Foundation of Vertebrate Zoology, Camarillo, CA	1	112
All	355	220

In addition, for purposes of measuring eggshell thickness and organochlorine (chlorinated hydrocarbon) contamination, a total of 26 eggs have been collected from Southeast Farallon Island, and a total of 68 eggs of ashy storm-petrels have been collected and salvaged from Santa Cruz Island, between 1968 and 2008 (Coulter and Risebrough 1973, p. 254; Kiff 1994, p. 11; Welsh and Carter) and in 2008 (McIver *et al.* 2009, p. 8). The majority of ashy storm-petrel birds and eggs that occur in scientific collections were collected at Southeast Farallon Island in the first half of the 20th century. More ashy storm-petrel birds and eggs were collected in 1911 (n = 120 specimens) than in any other year. Over a period of 124 years, an average of 2.6 ashy storm-petrel eggs per year and 2.9 birds per year have been collected over most of the geographic range of the species. The Service concludes that this low rate of collection, based on an estimated population size of 7,000 to 13,000 total birds, does not constitute a significant threat to the species.

In California, scientific research (monitoring of nesting success, mark and recapture using mist nets, radio telemetry) has been conducted on Southeast Farallon Island since the mid-1960s (James-Veitch 1970; Ainley *et al*. 1974, pp. 295-310; Ainley *et al*. 1990, pp. 128-162; Sydeman *et al*. 1998a, pp. 438-447; PRBO Conservation Science), at Santa Cruz Island since the mid-1990s (McIver 2002, pp. 1-70; McIver and Carter 2006, pp. 1-6; Carter *et al*. 2007, pp. 4-20; McIver *et al*. 2008, pp. 1-22; McIver *et al*. 2009, pp. 1-30), and at Santa Cruz and Santa Barbara Islands in 2004 and 2005 (Adams and Takekawa 2008, pp. 9-17). The Service is aware of the following disturbance (by researchers) of ashy storm-petrels: reduced hatching success at Southeast Farallon Island caused by handling of birds (James-Veitch 1970, p. 246); and reduced hatching success at Southeast Farallon Island in 1977 when ''researcher disturbance was great'' (Ainley *et al*. 1990, p. 161). Generally, however, researchers at both Southeast Farallon Island and Santa Cruz Island have implemented procedures to reduce possible disturbance to ashy storm-petrels during regular nest monitoring activities. Consequently, we find it unlikely that scientific studies have resulted in substantial disturbance of ashy storm-petrels.

Summary of Factor B

Our review of the available information does not indicate that commercial or recreational overutilization is a threat to the ashy storm-petrel. We are aware of the long history of scientific and educational collecting of ashy storm-petrel skins and eggs over the past 124 years. However, the amount and rate of collection does not represent a significant loss to the overall population of ashy storm-petrels rangewide, or in specific breeding locations. In addition, we have found that ashy storm-petrels are not currently negatively affected by scientific research. Therefore, based on the best available scientific information, we conclude that the ashy storm-petrel is not threatened by overutilization for commercial, recreational, scientific, or educational purposes at Southeast Farallon Island, at the Channel Islands, or rangewide.

Factor C: Disease or Predation

The petitioner asserts that predation by native predators, including western gulls, burrowing owls, barn owls, common ravens, peregrine falcons, deer mice, and island spotted skunks, impact ashy storm-petrel populations (CBD 2007, pp. 30-32). In addition, the petitioner asserts that nonnative predators, including house mice, black rats (*Rattus rattus*), and feral cats (*Felis catus*) affect ashy storm-petrel populations (CBD 2007, pp. 30-32).

As described in the Species Description section, native avian predators of the ashy storm-petrel include western gulls, burrowing owls, peregrine falcons, and common ravens. Native mammalian predators of ashy storm-petrel eggs and birds include deer mice and island spotted skunks. Known nonnative mammalian predators of ashy storm-petrel eggs and birds include house mice and feral cats (Ainley *et al*. 1990, p. 156; McChesney and Tershey 1998, p. 341). The black rat is a potential nonnative predator (McChesney and Tershey 1998, p. 342), although predation of ashy storm-petrels by rats has not been documented.

Predation can affect reproductive performance of storm-petrels during incubation and chick-rearing. Because ashy storm-petrel adults share egg incubation duties, the death of one adult of a breeding pair during the incubation stage could result in incomplete incubation and failure of the egg to hatch. Similarly, the death of one adult of a breeding pair of storm-petrels during the chick-rearing stage could result in death of the chick (by starvation or lack of brooding), especially if the chick is younger than about 50 days old (Mauck *et al*. 2004, p. 883).

Southeast Farallon Island – Avian Predation

The western gull and burrowing owl are the primary avian predators of ashy storm-petrels at Southeast Farallon Island (Sydeman *et al*. 1998a, pp. 445-446; PRBO Conservation Science). Approximately 30 percent of the world population of western gulls nests at Southeast Farallon Island (Penniman *et al*. 1990, p. 219). During the 1996 to 2006 period, the western gull breeding population at Southeast Farallon Island has been estimated at about 18,000 breeding birds (Service 2008, p. 42). The distribution of western gull nesting areas at Southeast Farallon Island has shifted and expanded since they were first mapped in 1959 (Ainley and Lewis 1974, p. 439; Penniman *et al*. 1990, p. 224), and since 1976, western gulls have nested densely over nearly the entire island, including Lighthouse Hill, which is considered prime ashy storm-petrel breeding habitat on Southeast Farallon Island (Ainley and Lewis 1974, p. 435; Ainley *et al*. 1990, p. 158; Sydeman *et al*. 1998a, p. 446).

The petitioner includes burrowing owls in its list of predators for the ashy storm-petrel but includes no information documenting a threat from burrowing owls (CBD 2007, p. 30). Burrowing owls do not breed on Southeast Farallon Island, but are regular fall migrants, and a few individuals (two to five per year, on average) overwinter at the island (DeSante and Ainley 1980, p. 30; Service 2008, p. 50). In the fall, burrowing owls at Southeast Farallon Island feed upon nonnative house mice when mice are seasonally abundant (Service 2008, p. 50). In late winter and early spring, after the mouse population at Southeast Farallon Island declines in numbers, burrowing owls prey upon storm-petrels, which are courting and prospecting for nesting sites (PRBO Conservation Science; Service 2008, p. 50). To reduce this cause of mortality, the Farallon National Wildlife Refuge has trapped and moved to the mainland several burrowing owls (Service 2008, p. 50). Additionally, the Service is developing a plan to eradicate the nonnative house mouse through rodenticide application and prevent future human introductions of mice (see Factor D: Inadequacy of Existing Regulatory Mechanisms below).

In the following discussion, we assess avian predation as a possible factor affecting the ashy storm-petrels by evaluating information on ashy storm-petrel productivity and mortality on Southeast Farallon Island and Santa Cruz Island. Sydeman *et al*. (2001, p. 315) reported that, among seabird species at Southeast Farallon Island laying a single-egg clutch each year, the ashy storm-petrel showed a significant pattern of change in reproductive performance, which increased through the mid-1980s, then decreased through 1997. Specifically, Sydeman *et al*. (2001, p. 317) reported that reduced reproductive performance of ashy storm-petrels in his model was related to significant changes in fledging success (numbers of chicks fledged per chicks hatched). Sydeman *et al*. (2001, p. 317) also concluded that hatching success in the 1990s was low and likely responsible for the decline in storm-petrel reproductive performance during that time period. An examination of values of productivity (fledged chicks per adult pair) of ashy storm-petrels at Southeast Farallon Island from 1971 through 2007 (see Table 2) shows variability in fledging success. Specifically, Ainley and Boekelheide (1990, p. 392) reported an average of 0.69 ashy storm-petrel chicks per pair from 1972 to 1983, Sydeman *et al*. (1998b, pp. 42-43) reported 0.74 chicks per pair using data from 1971 and 1972 and 1992, and Warzybok and Bradley (2007, p. 24) reported 0.54 chicks per pair using yearly data from 1996 through 2007 (and noted that productivity was higher in 2007 (0.53) than in 2006 (0.46)). These averages demonstrate variation in productivity over time, but only Sydeman's (2001) study provides a statistical analysis demonstrating a quadratic trend. Further, based on our review of the best available data (see discussion below), we do not believe that these productivity values are associated with lower numbers of ashy storm-petrels.

Ainley *et al*. (1974, p. 307) and Ainley *et al*. (1990, p. 157) estimated storm-petrel mortality rates based on presence of storm-petrel remains and storm-petrel bands found in gull pellets collected in 1971 and 1972. Sydeman *et al*. (1998b, pp. 1-74) collected wings of storm-petrel carcasses found on the southwestern slope of Lighthouse Hill from 1994 through 1996. In 2000, PRBO Conservation Science searched for and collected storm-petrel wings on Lighthouse Hill and other areas on Southeast Farallon Island, and categorized collected wings by type of avian predation (such as gull or owl). In both studies, wings (which were used as a measure of predation) were collected during the course of frequent nest-monitoring activities. Ainley *et al*. (1974, p. 307) and Ainley *et al*. (1990, p. 157) estimated that about one percent of the storm-petrel population (including ashy and Leach's storm-petrels) on Southeast Farallon Island were depredated by western gulls in 1971 and 1972. Sydeman *et al*. (1998b, pp. 21-22) estimated that 22 ashy storm-petrels were preyed upon by avian predators per year from 1994 through 1996 on Lighthouse Hill. In addition, Sydeman *et al*. (1998b, p. 21) estimated a 2.5 percent annual mortality rate of breeding ashy storm-petrels at Lighthouse Hill due to avian predation during the period 1994 to 1996, based on an estimated breeding population of 651 ashy storm-petrels at Lighthouse Hill. From January 2003 through August 2008, approximately 98 percent of ashy storm-petrel kills thought to be due to avian predation on Southeast Farallon Island occurred between February and August, when stratified by month (PRBO Conservation Science). Average annual total number of ashy storm-petrels killed during January 2003 through August 2008 was 114 total individuals. If birds on Southeast Farallon Island numbered the same as they did in 1972 (6,461 individuals) or 1992 (4,284 individuals), this level of predation would be 1.8 percent or 2.7 percent of the population, respectively; however, these estimates are speculative.

Estimates of ashy storm-petrel mortality rates at Southeast Farallon Island are highly dependent upon estimated population sizes. Ashy storm-petrels are nocturnal in their visits to breeding colonies and breed mainly in deep crevices that are inaccessible to researchers, and so it is difficult to obtain direct population counts of the species. Consequently, estimates of population size of storm-petrels are often obtained using capture-recapture techniques (for example, Sydeman *et al*. 1998a, pp. 438-447). For the years 1971, 1972, and 1992, Sydeman *et al*. (1998a, p. 442) provided estimates for the total population (non-breeders and breeders) and the breeding population of ashy storm-petrels at Southeast Farallon Island proper and at Lighthouse Hill on Southeast Farallon Island, an area considered prime ashy storm-petrel nesting habitat. Based on a comparison of data from 1972 and 1992, PBRO scientists indicated a decline of 22 to 66 percent (95 percent confidence interval) for total and breeding populations over the 20–year period for Lighthouse Hill, the sampling location considered most reliable for estimation of population size and population change (Sydeman *et al*. 1998a, p. 443). We interpret these results cautiously because they are based on two data points: one from 1972 and one 20 years later, from 1992. We hesitate to consider these results conclusive because animal populations can undergo cycles, peaks, or troughs that 2 years of data separated by 20 years cannot capture. Population estimates were also imprecise owing to large standard errors (for example, population estimates for one area ranged from 660 plus or minus 423 to 1,013 plus or minus 937; Sydeman *et al*. 1998a, p. 443).

Using preliminary analyses of more recent data of ashy storm-petrels captured in mist nets from 1999 through 2007, PRBO scientists state that the Southeast Farallon Island population may have increased in years subsequent to Sydeman's (1998a) study (Warzybok *et al*. 2006, p. 16; Warzybok and Bradley 2007, p. 17). Using data from 1999 to 2007, Warzybok and Bradley (2007, p. 17) describe an analysis of capture-recapture data that shows increasing capture rates and increasing survival of ashy storm-petrels. The authors also note that there were a greater number of occupied nesting sites than in previous years, although this observation could have been influenced by a change in monitoring techniques (Warzybok and Bradley 2007, p. 17). Warzybok and Bradley's (2007) report does not consider the proportion of birds caught that are nonbreeders, or potential changes in recapture probabilities through time; however, their report represents the most up-to-date information available at this time. Taken together, the results of Warzybok and Bradley's (2007) analyses suggest an increasing population of ashy storm-petrels. There are weaknesses in both the more recent reports that are not peer-reviewed (Warzybok *et al*. (2006) and Warzybok and Bradley (2007)) and the older report by Sydeman *et al* (1998a), which is based on two data points (one from 1972 and one 20 years later from 1992). Nevertheless, the Sydeman *et al*. (1998a), Warzybok *et al*. 2006, and Warzybok and Bradley (2007) studies are the best available assessments of population trends of ashy storm-petrels for the time periods they analyzed. The Warzybok *et al*. (2006) and Warzybok and Bradley (2007) reports contain data we consider most relevant to this status review because they were collected more recently than Sydeman *et al*.'s (1998a) data, they include 8 consecutive years of mark-recapture data, and they describe empirical observations of occupied nest sites in addition to statistical estimates of population trend and survival rate. The authors note that their study does not consider the proportion of birds caught that were nonbreeders or potential changes in recapture probabilities through time. Additionally, they noted an alteration in monitoring methods that made it difficult to determine whether increased occupancy was a result of greater reproductive effort or due to an increase in the ability to detect ashy storm-petrels (Warzybok and Bradley 2007, p. 17). While we do not dispute the historic population decline indicated by Sydeman *et al* (1998a), we believe that the updated information presented in Warzybok and Bradley's (2007, p. 17) preliminary analysis is more indicative of current population trends on Southeast Farallon Island.

In an unpublished report, Sydeman *et al*. (1998b, p. 21) concluded that an annual adult ashy storm-petrel survival probability of 86.7 percent would explain the 2.87 percent annual decrease in population size of ashy storm-petrels on Southeast Farallon Island (reported in Sydeman *et al.* 1998a, p. 443). Based on comparisons to adult survival estimates in research of other storm-petrel species, Sydeman *et al.* (1998b, pp. 21-22) presumed that an annual adult survival probability of 89.2 percent would maintain ashy storm-petrel population stability, and postulated that elimination of all gull predation would decrease adult mortality by 2.53 percent, potentially producing a stable population of ashy storm-petrels on Southeast Farallon Island. In populations of such long-lived organisms as seabirds, annual adult survival has been reported as the key parameter having the greatest influence on population growth rates in population models of seabirds (Sæther and Bakke 2000, p. 648; Cuthbert *et al.* 2001, p. 168; Doherty *et al.* 2004, p. 606).

Based on information on storm-petrel wings collected from Southeast Farallon Island from 2003 through 2008 (PRBO Conservation Science), approximately 98 percent of avian predation upon ashy storm-petrels on Southeast Farallon Island has occurred from February through August; this corresponds to the time of year of peak visitation by adults for breeding purposes and non-breeding birds prospecting for sites (James-Veitch 1970, p. 71; Ainley 1995, p. 5). During 2003 to 2008, avian predation categorized as gull, owl, and ''unknown'' accounted for approximately 57.4 percent, 34.3 percent, and 8.3 percent, respectively, of ashy storm-petrel deaths on Southeast Farallon Island (PRBO Conservation Science). This raw data allows us to infer that gulls are likely the greatest cause of ashy storm-petrel predation on Southeast Farallon Island.

Avian predation upon ashy storm-petrels at Southeast Farallon Island has probably occurred continually for decades. Based on recent reports showing possible increases in ashy storm-petrel survival and numbers (Warzybok and Bradley 2007, p. 17), we have no indication that such predation is impacting the population on Southeast Farallon Island or rangewide. We conclude that, since ashy storm-petrel populations appear to be increasing in the presence of such predation, we have no reason to believe that such predation will cause a change in that trend.

Southeast Farallon Island – House Mice

The petitioner cites Ainley *et al.* (1990, pp. 128-163) to support its claim that depredation of ashy storm-petrel eggs and chicks by nonnative house mice is the leading cause of egg failure and chick death, and significantly lowers ashy storm-petrel breeding success on Southeast Farallon Island (CBD 2007, p. 31). This claim is not supported by the information contained in Ainley *et al.* (1990, pp. 128-163). Specifically, out of a total of 274 ashy storm-petrel eggs laid during 1972-83, Ainley *et al.* (1990, p. 156) inferred predation by feral house mice of one ashy storm-petrel chick, based upon the remains of a partially eaten carcass. Twenty-six eggs (9.5 percent) were categorized as failed to hatch, 9 eggs (3.3 percent) were abandoned, 8 eggs (2.9 percent) ''disappeared,'' and 2 eggs (0.7 percent) were found broken; however, house mice were not mentioned as a significant cause of egg failure. Furthermore, our review of the available information reveals no information that suggests nonnative house mice pose a significant direct predation threat to ashy storm-petrels on Southeast Farallon Island. We have no data indicating that house mice prey upon ashy storm-petrel eggs or chicks anywhere else within the species' range.

Channel Islands – Black Rats and Feral Cats

The petitioner claims that nonnative black rats and feral cats are documented predators of seabird eggs, chicks, and adults; that black rats are extant on San Miguel, Santa Catalina, and San Clemente Islands; and feral cats may still impact ashy storm-petrel populations on Santa Catalina and San Clemente Islands (CBD 2007, p. 32). Beyond these claims, the petitioner provides no specific information documenting predation of ashy storm-petrels by nonnative black rats or feral cats.

Nonnative black rats and (feral) cats are well-documented predators of seabird eggs, chicks, and adults and have caused seabird population declines worldwide, including California (McChesney and Tershey 1999, pp. 335-347; Jones *et al.* 2008, pp. 16-26). At San Miguel Island proper, black rats have a limited distribution, primarily found in shoreline and bluff habitats on the west and north sides of the island (Erickson and Halvorson 1990, p. 13). Possible nesting of ashy storm-petrels on San Miguel Island proper has been presumed, based on birds with brood patches captured in mist nets deployed between Harris Point and Cuyler Harbor (on the island's north side) (Carter *et al.* 2008, p. 119). Ashy storm-petrels may also breed in cliffs near Hoffman Point, on San Miguel Island proper (Carter *et al.* 2008c, p. 17). However, no population estimate for ashy storm-petrels is available for San Miguel Island proper (Carter *et al.* 1992, p. I-87). As stated earlier, the black rat is a potential nonnative predator of ashy storm-petrels (McChesney and Tershey 1998, p. 342), although predation of ashy storm-petrels by rats has not been documented. Predation of ashy storm-petrels at Santa Catalina Island and San Clemente Island by feral cats has not been documented. Ashy storm-petrels have been confirmed to nest in very small numbers (approximately 0.2 percent of total breeding population) on offshore rocks at Santa Catalina Island (Ship Rock) and San Clemente Island (Seal Cove Area), locations that are likely inaccessible to feral cats on the islands proper. Therefore, we conclude that it is likely that less than one percent of the total population of ashy storm-petrels may be susceptible to predation from black rats and feral cats. We have examined the available information concerning the predation threat from nonnative black rats and feral cats and have found no direct evidence showing that black rats and cats currently prey on ashy storm-petrels in the Channel Islands, Southeast Farallon Island, or rangewide.

Santa Cruz Island – Barn Owl

The petitioner includes the barn owl on its list of native avian predators of ashy storm-petrels but provides no further information regarding this threat (CBD 2007, p. 30). Barn owls have a worldwide distribution and occur throughout the range of the ashy storm-petrel (Marti 1992, p. 1; Rudolph 1970, p. 8). Barn owls hunt mostly at night but occasionally diurnally (Marti 1992, p. 3). Most hunting is done in low flight above ground in open habitats (Bunn *et al.* 1982, p. 11), but some hunting occurs from perches (Taylor 1994, p. 58). McIver (2002, p. 46) reports that nest-site searching behaviors of adult ashy storm-petrel adults and the mobility of older chicks are activities that increase the susceptibility of ashy storm-petrels to predation by barn owls. At Santa Cruz Island, researchers have observed predation of ashy storm-petrels by barn owls. In a study at five breeding locations on Santa Cruz Island, McIver (2002, p. 69) documented 83 ashy storm-petrels (76 adults and 7 chicks) killed by barn owls from 1995 to 1997. Approximately 97.6 percent of these ashy storm-petrels were at two locations (75 birds at Bat Cave and 6 birds at Orizaba Rock) (McIver 2002, p. 69). More recent data reported that 13 ashy storm-petrels were killed by barn owls on Santa Cruz Island from 2005 to 2008 (McIver and Carter 2006, pp. 3-4;

McIver *et al.* 2008, pp. 4-6; McIver *et al.* 2009, pp. 5-10). At Santa Cruz Island, the mortality rate of ashy storm-petrel adults due to barn owl predation was approximately 5.4 percent during the 1995-97 period (n = 350 estimated number of adults in nests) and 0.8 percent during the 2005 to 2008 period (n = 304 estimated number of adults in nests) (McIver and Carter, unpublished data). Our analysis indicates that mortality of ashy storm-petrels due to barn owls was heavy during the 1995 to 1997 period (McIver 2002, p. 30), but is currently much reduced (McIver *et al.*, in preparation, p. 1); the reason for this decline is unknown. We conclude that reduced avian predation on Santa Cruz Island is the most likely explanation for the observed increase in ashy storm-petrel productivity (for ashy storm-petrels that have escaped skunk predation) there. In addition, we conclude that current levels of predation of ashy storm-petrels by barn owls at Santa Cruz Island do not constitute a substantial threat to the species. Since barn owls do not occur anywhere else within the range of the ashy storm-petrel, we also conclude that barn owls are not a threat to the ashy storm-petrel rangewide.

Santa Cruz Island – Island Spotted Skunk

Ashy storm-petrels are known to breed at 11 locations on Santa Cruz Island (Carter *et al.* 2008, p. 119), and for this status review, we have compiled information from many sources to estimate the number of ashy storm-petrels breeding in sea caves and on offshore rocks at Santa Cruz Island. Ashy storm-petrels may nest in crevices that occur in steep cliffs on Santa Cruz Island (Carter *et al.* 2008, p. 121); however, accessing and censusing these cliffs is extremely difficult for researchers, and, therefore, we can provide no estimate here of numbers of ashy storm-petrels that may nest in cliffs at Santa Cruz Island. Excluding Orizaba (''Sppit'') Rock, Carter *et al.* (1992, p. I-87) estimated 273 breeding ashy storm-petrels during the periods from 1975 to 1980 and 1989 to 1991 at offshore rocks at Santa Cruz Island, based on summaries of historical data and mark–recapture data. Based on a total of average numbers of active nests observed at each location (McIver and Carter 2006, pp. 2-3; Carter *et al.* 2007, pp. 7-9; McIver *et al.* 2008, pp. 4-6; McIver *et al.* 2009, p. 24) and other information (Carter *et al.* 1992, p. I-87; McIver *et al.* 2009, p. 24; Carter, unpublished data; McIver *et al.* in preparation), approximately 32 breeding ashy storm-petrels utilized Orizaba Rock, and 231 breeding ashy storm-petrels utilized sea caves at Santa Cruz Island during 2005 to 2008. Combining these population values, we estimate that 305 ashy storm-petrels nested on offshore rocks at Santa Cruz Island, and 230 ashy storm-petrels nested in sea caves at Santa Cruz Island from 2005 to 2008. Therefore, approximately 43 percent of ashy storm-petrels nesting at Santa Cruz Island used sea caves from 2005 to 2008. This translates to approximately 7 to 9 percent of the total ashy storm-petrel population, depending on the population estimates used.

The island spotted skunk occurs only on Santa Rosa and Santa Cruz Islands (Crooks and Van Vuren, p. 380) and constitutes no threat to ashy storm-petrels anywhere else. On Santa Cruz Island, the island spotted skunk population has increased recently from rare to abundant (Crooks and Van Vuren 1994, p. 380; Jones, *et al.* 2008, p. 76). Jones *et al.* (2008, pp. 81-84) reports that there are two explanations for this increase in spotted skunk numbers at Santa Cruz Island: competitive release (an increase in population due to reduced competition) due to decline of the island fox (*Urocyon littoralis santacruzae*), and recovery of vegetation due to removal of feral livestock. In a radio-telemetry study on Santa Cruz Island, Crooks and Van Vuren (1994, pp. 381-382) found that island spotted skunks utilized chaparral grasslands, open grasslands, and coastal sage scrub habitats; fed on deer mice, lizards, and insects; and were active only at night. Jones *et al.* (2008, p. 80) reported that island spotted skunks also utilized fennel-dominated and riparian habitats. Like other sea caves in which ashy storm-petrels nest at Santa Cruz Island, Bat Cave and Cavern Point Cove Caves occur at the base of sheer cliffs and coastal bluffs (McIver 2002, p. 8). The coastal slopes above the sea caves at Santa Cruz Island comprise coastal bluff scrub habitat (Junak *et al.* 1995, p. 14), likely utilized by island spotted skunks. Skunks may have fallen or jumped off nearby bluffs or cliffs and swam into the caves (Carter and McIver 2006, p. 4). Like other procellariids, ashy storm-petrels have a strong and distinctive musky odor (James-Veitch 1970, p. 86), and this odor can be detected at the entrances of the sea caves at Santa Cruz Island in which ashy storm-petrels nest (McIver, *personal observation*). In addition, ashy storm-petrels return to and depart their nesting colonies at night, and nighttime activities at nesting locations include vocalizations and aerial displays, including circling flights at the sea cave entrances (James-Veitch 1970, p. 24; McIver *personal observation*).

During the period from 2005 to 2008, researchers reported that island spotted skunks killed at least 100 ashy storm-petrels at two locations on the northeast coast of Santa Cruz Island: 70 ashy storm-petrels at Bat Cave in 2005 and 32 ashy storm-petrels at Cavern Point Cove Caves in 2008 (McIver and Carter 2006, p. 3; McIver *et al.* 2009, p. 7). The mortality event at Bat Cave in 2005 resulted in the temporary loss of the largest ashy storm-petrel colony at Santa Cruz Island (average of 80 nests per year in 1995-97 (McIver 2002, p. 24)) and the colony with the largest numbers of monitored nests of the ashy storm-petrel (McIver and Carter 2006, p. 4). One skunk was live-trapped and removed from the cave in June 2005, and the other was presumed to have died in or left the cave by the next year (McIver and Carter 2006, p. 3; Carter *et al.* 2007, p. 7). Ashy storm-petrel nests were documented in Bat Cave in 2006 (19 nests), 2007 (28 nests), and 2008 (40 nests), and no further evidence of skunks in the cave has been observed since 2005 (Carter *et al.* 2007, p. 7; McIver *et al.* 2008, p. 4; McIver *et al.* 2009, p. 6). The mortality event at Cavern Point Cove Caves in 2008, located approximately 0.6 mi (1 km) east of Bat Cave, resulted in the death of at least 32 adult ashy storm-petrels and complete reproductive failure at this location in 2008 (McIver *et al.* 2009, p. 7). A skunk was live-trapped and removed from Cavern Point Cove Caves in early July 2008, and marked and released on the island approximately 2.5 mi (4 km) southeast from the capture location (McIver *et al.* 2009, p. 7). Live-traps were deployed in Bat Cave and Cavern Point Cove Caves and monitored regularly for the remainder of the 2008 breeding season, to capture and remove skunks and prevent further storm-petrel deaths (McIver *et al.* 2009, p. 7). A second spotted skunk was caught in a live trap at Cavern Point Cove Caves in September 2008, but died. After the 2005 predation event at Bat Cave, researchers considered the skunk-predation incident to be an isolated, unusual event (McIver and Carter 2006, p. 4). Recent research shows that island spotted skunk population numbers at Santa Cruz Island have likely increased to carrying capacity, possibly in response to reduced numbers of island foxes (Jones *et al.* 2008, pp. 81-84). Given the additional skunk-predation incident in 2008, and known increases in island spotted skunk population numbers on the island, ashy storm-petrels nesting in sea caves on Santa Cruz Island may be vulnerable to episodic predation by skunks (McIver *et al.* 2009, p. 14). The spotted skunk diet is largely comprised of invertebrates and vertebrates other than birds. For example, during 1992, occurrence of avian remains in spotted skunk scat occurred only in 4 percent of acquired samples. Samples in 2003 and 2004 contained no avian remains (Jones *et al.* 2008, pp. 81-84).

The future of island spotted skunk population numbers and trends at Santa Cruz Island is uncertain and may be directly related to the recovery status of the island fox (Jones *et al.* 2008, p. 83). A recovering population of island foxes may or may not be able to suppress the population of island spotted skunks to its former levels, and this may result in a new equilibrium of fox and skunk population numbers at Santa Cruz Island (Jones *et al.* 2008, p. 83). Regardless, spotted skunk predation is unlikely to increase beyond levels observed in recent years, because Jones *et al.* (2008, p. 83) suggested that skunks may have been approaching or even exceeding carrying capacity during their study. The conclusion of Jones *et al.* (2008, p. 83) was supported by a trend toward smaller skunk body size and undiminished skunk home ranges in 2003–2004 versus 1992. In addition, the proportion of juvenile skunks captured decreased during the study, from 24 percent in September 2003 to 5 percent in September 2004. This leads us to believe that the spotted skunk predation will not likely affect more than a very small percentage (approximately 7 to 9 percent) of the overall ashy storm-petrel population.

Santa Cruz Island is owned and managed by the Park and the Nature Conservancy. The Park owns and manages approximately the eastern 25 percent of the island, where two ashy storm-petrel sea-cave locations (Bat Cave and Cavern Point Cove Caves) occur; the Park also manages the offshore rocks at the island, six of which (Del Mar Rock, Diablo Rocks, Orizaba Rock, Scorpion Rock, Willow Anchorage Rocks, and Gull Island) are ashy storm-petrel breeding locations. The Nature Conservancy owns approximately the western 75 percent of the island, where three ashy storm-petrel sea caves (Shipwreck Cave, Dry Sandy Beach Cave, and Cave of the Bird's Eggs) occur. Currently, monitoring of nesting success of ashy storm-petrels at Santa Cruz Island is being conducted in association with restoration activities, funded through 2010 by the Montrose Settlements Restoration Program (Montrose Settlements Restoration Program 2005, p. 196). Researchers have proposed the development and implementation of a skunk management plan to prevent skunk predation of storm-petrels in sea caves at Santa Cruz Island; this plan is scheduled to be implemented by the Park during 2009-10 (McIver *et al.* 2009, p. 16).

Further research on population size, trends, and distribution of island spotted skunks at Santa Cruz Island is needed. Based on the relatively isolated mortality events at Bat Cave and Cavern Point Cove Caves, we characterize the threat of predation by island spotted skunks as sporadic and believe that efforts to control skunks by the Park will diminish the possibility of skunk predation even further. We estimate that approximately 7 to 9 percent of the total population of ashy storm-petrels is susceptible to this episodic threat, and therefore predation by island spotted skunks is not a significant concern at the Channel Islands, nor is it a threat in any way at Southeast Farallon Island, or rangewide.

Santa Cruz Island – Deer Mice

Deer mice occur in a variety of habitats on Santa Cruz Island, including chaparral, rocky outcrops, marsh, riparian, pine forest, oak woodland, buildings, and sea caves (Mayfield *et al.* 2000, pp. 509; McIver 2002, pp. 29-30). Egg predation by deer mice has been documented for crevice-nesting seabird species and usually occurs during periods of parental absence (Murray *et al.* 1983, p. 17; Drever *et al.* 2000, pp. 2013-2015; Blight *et al.* 1999, pp. 872-873). In a 4–year study at Santa Cruz Island, McIver (2002, pp. 40-41) reported that deer mice scavenged or preyed upon at least four ashy storm-petrel eggs, and concluded that egg predation by deer mice was likely not a major cause of egg mortality there. In addition, (McIver 2002, p. 41) reported that two ashy storm-petrel chicks were found partially eaten by mice, although it was unknown if mice killed these chicks or scavenged them after they had died of other causes. Similarly, researchers at Santa Cruz Island during 2005 to 2008 did not find predation of ashy storm-petrel eggs by deer mice to be significant (less than six total) (McIver and Carter 2006, pp. 2-4; Carter *et al.* 2007, pp. 8-24; McIver *et al.* 2008, p. 5; McIver *et al.* 2009, pp. 5-8). Our review of the available information reveals no other information that indicates predation of ashy storm-petrel eggs by deer mice is a substantial threat at the Channel Islands, Southeast Farallon Island, or rangewide.

Disease

The petitioner did not raise disease as a threat to the ashy storm-petrel. Moreover, disease in ashy storm-petrels has not been reported as a threat to the species (Ainley 1995, p. 8). Accordingly, we conclude disease is not a threat to the ashy storm-petrel on Southeast Farallon Island, the Channel Islands, or rangewide.

Summary of Factor C

Approximately 36 to 53 percent of all ashy storm-petrels breed on Southeast Farallon Island, and ashy storm-petrels are preyed upon by several predator species, the most notable being western gulls. Avian predation of ashy storm-petrels has persisted on Southeast Farallon Island at similar or increasing levels since at least 1994, yet recent reports show that ashy storm-petrel survival appears to be increasing, and their total numbers also appear to be increasing. Therefore, at this time, we do not consider predation by western gulls to be a significant threat to ashy storm-petrels. Our analysis of the available information reveals little information regarding the extent of burrowing owl predation, and predation of ashy storm-petrel eggs and chicks by nonnative house mice on Southeast Farallon Island does not pose a significant threat to ashy storm-petrels. We conclude that predation of ashy storm-petrels by island spotted skunks on Santa Cruz Island could occur on a sporadic basis, but thus far, spotted skunks have affected less than 7 to 9 percent of the total ashy storm-petrel population. Once removed, spotted skunks no longer pose a threat to ashy storm-petrels, and monitoring for skunks is planned in coming years. We conclude that predation of ashy storm-petrel adults and chicks by barn owls, and predation of ashy storm-petrel eggs by deer mice on Santa Cruz Island do not pose a threat to ashy storm-petrels. Finally, we conclude that predation of ashy storm-petrels by feral cats and nonnative black rats does not pose a significant threat to ashy storm-petrels.

Factor D: Inadequacy of Existing Regulatory Mechanisms

The petitioner asserts that existing regulatory mechanisms have been ineffective at preventing the decline of the ashy storm-petrel and in mitigating many of the threats to the species (CBD 2007, p. 32). The petitioner claims that the ineffectiveness of regulatory mechanisms is demonstrated by the failure to eradicate nonnative predators, the inadequate regulation of artificial light pollution, the failure to restrict human disturbance at breeding sites, the lack of regulations on greenhouse gases, and the failure of the Migratory Bird Treaty Act (16 U.S.C. 703-712) to protect the species from the identified threats (CBD 2007, pp. 32-35). Consequently, in this section we discuss these and other regulatory mechanisms.

U.S. Federal Protection

National Environmental Policy Act

The National Environmental Policy Act of 1970 (NEPA) (42 U.S.C. 4371 *et seq.*) requires that all activities undertaken, authorized, or funded by Federal agencies be analyzed for potential impacts to the human environment prior to implementation. NEPA does not require adverse impacts be fully mitigated, and some impacts could still occur. Additionally, NEPA is only required for projects with a Federal nexus, and therefore, actions that do not require a Federal permit or occur on private land are not required to comply with this law.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) states that it is unlawful ''to pursue, hunt, take, capture kill, or attempt to take, capture or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured.'' The ashy storm-petrel is included in the list of migratory birds protected by the MBTA. The MBTA provides penalties for anyone in violation of its provisions. The petitioner claims that the MBTA does not provide protection from many of the threats facing the species such as plastic pollution, light pollution, nonnative predators, and changing ocean conditions as a consequence of global warming (CBD 2007, p. 36). In addition, the petitioner asserts that, unlike the Act, the MBTA provides no citizen suit provision, no requirement for designation or protection of critical habitat, no consultation provision to ensure Federal agency actions do not jeopardize the species, nor an affirmative conservation mandate to recover the species. The provisions of the MBTA prevent hunting, capturing, or killing or attempting to take, capture, or kill, or possess ashy storm-petrels. The degree to which the protections are applied are a matter of enforcement and there are likely to be instances where permits under the MBTA are not obtained and some mortality may occur. However, our analysis did not reveal information that would suggest a level of mortality that would be a significant threat to the species. Overall the MBTA provides protections for the ashy storm-petrel that would otherwise not exist.

On January 10, 2001, President Clinton issued Executive Order 13186, pertaining to responsibilities of Federal agencies to protect migratory birds, and directing executive departments and agencies to further implement the MBTA (66 FR 3853; January 17, 2001). Executive Order 13186 directs each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement (within 2 years) a memorandum of understanding (MOU) with the Service that promotes the conservation of migratory bird populations. The DOD entered into a MOU with the Service on August 30, 2006 (71 FR 51580), which emphasizes a general collaborative approach to conservation of migratory birds. Conservation measures include minimizing disturbance to breeding, migration, and wintering habitats. While this MOU is non-binding and it does not authorize the take of migratory birds, it does provide an additional opportunity for the Service to continue to reduce the threat of habitat loss to the ashy storm-petrel on lands owned and managed by the DOD, including San Clemente Island. Currently, approximately 0.1 percent of the entire ashy storm-petrel population breeds on DOD lands. We are not aware that any other Federal agency has entered into a similar MOU with the Service.

National Wildlife Refuge System Improvement Act of 1997

The National Wildlife Refuge System is managed by the Service primarily for the benefit of fish, wildlife, and plant resources and their habitats (Service 2008, p. 2). The Farallon National Wildlife Refuge (Refuge) was established in 1909, is located approximately 28 miles west of San Francisco, and is composed of several islands, including Southeast Farallon Island. On December 22, 2008, we published a notice in the **Federal Register** announcing the availability of a draft Comprehensive Conservation Plan (CCP) and environmental assessment to manage natural resources at the Refuge (73 FR 78386). As stated earlier, ashy storm-petrels at Southeast Farallon Island are susceptible to predation by western gulls (which breed at the island) and burrowing owls (which do not breed at the island but are regular fall migrants and overwinter at the island). Managers at the Refuge are concerned about high levels of avian predation upon and reduced productivity and survivorship of ashy storm-petrels at Southeast Farallon Island. Consequently, within 5 years of approval of the final CCP (anticipated in year 2010), the Refuge proposes the following management actions: (1) Develop a plan to eradicate the nonnative house mouse through rodenticide application and prevent future human introductions of mice; (2) translocate to the mainland individual burrowing owls that overwinter on Southeast Farallon Island, until mice at the island are eradicated; (3) monitor western gull nests for ashy storm-petrel remains, and conduct experimental selective removal (culling) of no more than 10 western gulls annually to reduce predation upon ashy storm-petrels; and (4) monitor the ashy storm-petrel population (Service 2008, pp. 84, 98).

The management actions, once implemented, may be successful in reducing predation of ashy storm-petrels by western gulls and burrowing owls, which, in turn, may result in an increase in productivity and survivorship of ashy storm-petrels at Southeast Farallon Island. However, we are not basing our finding of whether listing is warranted on future actions contained in the draft CCP. Nevertheless, the proposed management actions in the Refuge's draft CCP, when approved and funded, will likely benefit the ashy storm-petrel at Southeast Farallon Island, where an estimated 36 to 53 percent of all breeding ashy storm-petrels occur.

National Park Service Organic Act

The National Park Service Organic Act (16 U.S.C. l *et seq.*) established the U.S. National Park Service, ''* * * to promote and regulate the use of the * * * national parks * * * which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.'' On March 5, 1980, the U.S. Congress established as the Channel Islands National Park (Park) the islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, Santa Barbara, and the submerged lands and waters within one nautical mile of each island. In 2007, in accordance with 36 CFR, Chapters 1-7, the Park prohibited access by park visitors on: 1) Offshore rocks and islets in the Park; 2) Bat Cave and Cavern Point Cove Caves, Santa Cruz Island;

and 3) shorelines and cliffs at Santa Barbara Island, to protect wildlife and natural resources, including ashy storm-petrels (NPS 2007, p. 2). Thus, visitor access is prohibited at 16 ashy storm-petrel breeding locations (locations #7-22, in Table 1) managed by the National Park Service, which constitutes approximately 99 percent of the breeding locations in the Channel Islands and, depending on population estimates, approximately 44 to 60 percent of the ashy storm-petrel breeding locations rangewide.

Under the authority of the Antiquities Act of 1906, the California Coastal National Monument (CCNM) was established by Presidential Proclamation number 7264, on January 11, 2000. The Presidential Proclamation defined the CCNM as all unappropriated or unreserved lands and interest in lands owned or controlled by the United States in the form of islands, rocks, exposed reefs, and pinnacles above mean high tide within 12 nautical miles of the shoreline of the State of California. The CCNM is comprised of more than 20,000 small islands, rocks, exposed reefs, and pinnacles within the corridor extending 12 nautical miles (22.2 km) from the shoreline between Mexico and Oregon. This proclamation directed the Secretary of the Interior to manage the monument through the Bureau of Land Management (BLM). In 2005, the BLM approved a resource management plan for the CCNM (BLM 2005), which contains broad direction for the protection of the geologic formations and habitats for seabirds, and focuses on multi-agency and other partnerships and involvement of local communities as the keys to management and protection. Five ashy storm-petrel breeding locations (locations # 1, 2, 6, 23 and 24 in Table 1) are managed by the BLM, which, depending on population estimates used, comprise about 1.2 percent to 1.7 percent of the total population of breeding ashy storm-petrels.

Sikes Act

The Sikes Act of 1960 (16 U.S.C. 670 *et seq.*) authorizes the Secretary of Defense to develop cooperative plans for conservation and rehabilitation programs on military reservations and to establish outdoor recreation facilities, and provides for the Secretaries of Agriculture and the Interior to develop cooperative plans for conservation and rehabilitation programs on public lands under their jurisdiction. The Sikes Act Improvement Act of 1997 required Department of Defense (DOD) installations to prepare Integrated Natural Resources Management Plans (INRMPs). Consistent with the use of military installations to ensure the readiness of the Armed Forces, INRMPs provide for the conservation and rehabilitation of natural resources on military lands and incorporate, to the maximum extent practicable, ecosystem management principles and provide the landscape necessary to sustain military land uses. The U.S. Navy currently controls feral cats on San Clemente Island through an existing INRMP (Hering 2008, p. 6), and this may benefit the small numbers of ashy storm-petrels nesting there.

National Marine Sanctuaries Act

The National Marine Sanctuaries Act of 1972 (NMSA) (16 U.S.C. 1431 *et seq.*) authorizes the Secretary of Commerce, and specifically the National Oceanic and Atmospheric Administration (NOAA), to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or esthetic qualities as national marine sanctuaries. Within the range of the ashy storm-petrel, the four national marine sanctuaries (NMS) that have been designated in California are: the Channel Islands NM Sanctuary (CINMS) off the coast of southern California (1980); Gulf of the Farallons NMS (formerly Point-Reyes Farallon Islands NMS [1981]); Cordell Bank NMS off the coast of central California (1989); and the Monterey Bay NMS (1992). In 1989, Congress passed a law that prohibits the exploration for, or the development or production of, oil, gas, or minerals in any area of the Cordell Bank National Marine Sanctuary (P.L. 101-74). The Oceans Act of 1992 (P.L. 102-587) prohibits leasing, exploration of, producing, or developing oil and gas in the Monterey Bay National Marine Sanctuary; and includes a requirement for Federal agencies to consult with the program on activities that are likely to injure sanctuary resources. In 2007, NOAA expanded the state ‘‘no-take’’ marine reserves and one of the limited take marine conservation areas in the CINMS to include Federal waters out to 6 nautical miles (11 km), which prohibited or limited removal of, and injury to, any CINMS resource, including ashy storm-petrels (NOAA 2007, pp. 29208-29235). Specifically, lobster harvest and recreational fishing for pelagic finfish (with hook and line only) are allowed within the marine conservation area, while all other extraction or injury to CINMS resources is prohibited (NOAA 2007, p. 29212). These Federal marine reserves were established in conjunction with State of California regulatory processes (see ‘‘State of California Protection’’ subsection below). In addition, on March 25, 2005, the California Fish and Game Commission adopted the Market Squid Fishery Management Plan (MSFMP; California Fish and Game Commission 2005, pp. 1-558), which prohibits taking of market squid using attracting lights in all waters of the Gulf of the Farallons NMS at any time. Accordingly, there are regulatory measures that prohibit the use of bright lights for commercial fishing at 10 ashy storm-petrel breeding locations, including around Southeast Farallon Island, which constitute approximately 36 to 53 percent of the rangewide population and for approximately 16 percent of the remainder of the population rangewide, for a total of approximately 52 to 69 percent of the total population.

Outer Continental Shelf Lands Act

The Outer Continental Shelf Lands Act of 1953 (OCSLA) (43 U.S.C. 1331 *et seq.*) provides the Secretary of the Interior, on behalf of the Federal Government, with authority to manage the mineral resources, including oil and gas, on the outer continental shelf (OCS) and defines the OCS as all submerged lands lying seaward of the State and Federal boundary. The Federal Oil & Gas Royalty Management Act of 1982 (30 U.S.C. 1701 *et seq.*) mandates protection of the environment and conservation of Federal lands in the course of building oil and gas facilities. The Secretary of the Interior designated the Minerals Management Service (MMS) as the administrative agency responsible for the mineral leasing of submerged OCS lands and for the supervision of offshore operations after lease issuance. In managing the offshore oil and gas resources, the MMS conducts environmental studies, issues leases, and regulates operations conducted on the OCS. The regulatory responsibilities include issuing permits for oil and gas exploration, development, and production and inspecting operations during all of these activities. Within the range of the ashy storm-petrel, the MMS manages the offshore mineral resources of 23 active leases and 36 undeveloped leases, in coordination with other Federal, State, and local agencies and in consultation with the public (McCrary *et al.* 2003, pp. 43-45).

Deepwater Port Act of 1974

The Deepwater Port Act of 1974 (DWPA) (33 U.S.C. 1501 *et seq.*) authorizes the U.S. Coast Guard (USCG;

Department of Homeland Security) to regulate Liqufied Natural Gas deepwater ports and shoreside terminals. Originally pertaining only to oil, the Maritime Transportation Security Act of 2002 (MTSA) (33 U.S.C. 1221 *et seq.*) amended the DWPA to include natural gas. The regulations pertaining to the licensing, design, equipment and operation of deepwater ports and shoreside terminals are found in Title 33 CFR parts 148, 149 and 150. The Secretary of the Department of Homeland Security delegated the processing of DWP applications to the USCG and the Maritime Administration (MARAD), respectively. MARAD is the license issuing authority and works in concert with the USCG in developing the Environmental Impact Statement, while the USCG has primary jurisdiction over design, equipment and operations and security requirements. The DWPA established a specific time frame of 330 days from the date of publication of a **Federal Register** notice of a ''complete'' application to the date of approval or denial of a deepwater port license. Among other requirements, an applicant for a deepwater port license must demonstrate consistency with the Coastal Zone Management Plan of the adjacent coastal States. The USCG and MARAD, in cooperation with other Federal agencies, must comply with the requirements of the National Environmental Policy Act in processing deepwater port applications within the timeframes prescribed in the DWPA. To date the USCG has received the following two deepwater port applications, which are pending USCG approval, and occur within the range of the ashy storm-petrel: Clearwater Port LNG, Project NorthernStar Natural Gas; and Port Esperanza, Esperanza Energy LLC. A third proposed LNG project, the Oceanway LNG Terminal, was withdrawn by Woodside Petroleum, Ltd. in January 2009 (Woodside Petroleum Ltd. 2009, pp. 1-2).

Federal Power Act of 1920

Section 23(b)(1) of the Federal Power Act of 1920 (16 U.S.C. 791a *et. seq.*) grants jurisdiction to the Federal Energy Regulatory Commission (FERC) for the licensing of hydropower development (for example, wave energy projects) in offshore waters of the United States. We are aware of at least one proposed wave energy project that occurs within the range of the ashy storm-petrel. FERC licensing procedures include analyzing potential project effects on natural resources including, but not limited to, water quality, water use, marine mammals, fish, birds, geology, land use, ocean use, navigation, recreation, aesthetics, and cultural resources.

Oil Pollution Act of 1990 (OPA)

The Oil Pollution Act of 1990 (*33 U.S.C. 2701 et. seq.*) amended the Clean Water Act and addressed the wide range of problems associated with preventing, responding to, and paying for oil pollution incidents in navigable waters of the United States. It created a comprehensive prevention, response, liability, and compensation regime to deal with vessel- and facility-caused oil pollution to U.S. navigable waters. The OPA increased Federal oversight of maritime oil transportation and provided environmental safeguards by: setting new requirements for vessel construction and crew licensing and manning; mandating contingency planning; enhancing Federal response capability; broadening enforcement authority; increasing penalties and potential liabilities; and creating new research and development programs. Various Federal agencies are responsible for implementing the OPA. The Environmental Protection Agency (EPA) is responsible for non-transportation-related onshore facilities and incidents in the Inland Zone, the USCG is responsible for marine transportation-related facilities and incidents in the Coastal Zone, MARAD (in the Department of Transportation) is responsible for promoting the U.S. merchant marine and shipbuilding industry, and the Department of Commerce (specifically, NOAA) is responsible for natural resource damage assessments relating to oil discharges. The OPA requires a phase-out of single-hull tankers from U.S. waters by 2015. Committee on Oil Pollution Act of 1990 *et al.* (1998, p. 147) report that although the mandatory phase-out schedule of section 4115 of the OPA bans all single-hull tankers (without double bottoms or double sides) from U.S. trade after 2010, it is probable that under the deepwater port and lightering zone exemption, large single-hull vessels up to 30 years of age will operate in the United States through 2015. For this status review, we could not find specific information indicating how many single-hull tankers currently utilize California waters, and whether compliance with the double-hull provisions of section 4115 of the OPA will be achieved. The OPA imposes liability for removal costs and damages resulting from an incident in which oil is discharged into navigable waters or adjoining shorelines or the exclusive economic zone. In 2006, a damage assessment, restoration plan, and environmental assessment (Luckenbach 2006, pp. 1-165) was presented by Natural Resource Trustee Agencies (Service, NOAA, National Park Service, and California Department of Fish and Game) for natural resources (including ashy storm-petrels) injured during multiple oil spills that occurred off the coast of San Francisco, California, from 1990 to December 2003.

Clean Air Act of 1970

The Clean Air Act of 1970 (42 U.S.C. 7401 *et seq.*) EPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In 2007, the Supreme Court ruled that gases that cause global warming are pollutants under the Clean Air Act, and that the EPA has the authority to regulate carbon dioxide and other heat-trapping gases (*Massachusetts et al.* v. *EPA* 2007 [Case No. 05-1120]). The petitioner claims that the ashy storm-petrel is threatened by a lack of regulatory mechanisms to curb greenhouse gases (GHG) that contribute to global temperature rises, ocean acidification, and sea level rise (CBD 2007, p. 34). As stated earlier, our status review did not reveal information that indicates productivity of ashy storm-petrels is adversely affected by ocean acidification, and we conclude that sea level rise within the next 40 to 50 years is not a significant threat to ashy storm-petrels.

State of California Protection

The California Department of Fish and Game (CDFG) is the State agency responsible for managing California's fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The ashy storm-petrel is designated as a Species of Special Concern by the CDFG (Carter *et al.* 2008, pp. 117-124). This status does not confer regulatory protection to the species and applies to animals not listed under the Act or the California Endangered Species Act (CESA), but which nonetheless (1) are declining at a rate that could result in listing, or (2) historically occurred in low numbers and known threats to their persistence currently exist. In addition, this designation is intended to result in special consideration for these animals by the CDFG, land managers, consulting biologists, and others, and is intended to: focus attention on the species to achieve conservation and recovery of these animals before they meet CESA criteria for listing as threatened or endangered; stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species; and focus research and management attention on the species.

California Environmental Quality Act of 1970 (CEQA) does not regulate land use, but requires all local and State agencies to avoid or minimize environmental damage where feasible, during the course of proposed projects. CEQA provides protection not only for State-listed or federally listed species, but also for any species designated as species of special concern by the CDFG.

In 1999, the California legislature approved and the governor signed the Marine Life Protection Act (MLPA; Stats.1999, Chapter 1015). The MLPA requires that the CDFG prepare and present to the Fish and Game Commission a master plan that will guide the adoption and implementation of a Marine Life Protection Program, which includes a statewide network of marine protected areas. In 2003, the State of California established nine State Marine Reserves in the California Channel Islands, which (in part) prohibit within these reserves market squid fishery activities that use bright lights. In 2008, the CDFG published a revised draft plan for marine protected areas in California (CDFG 2008a). The CDFG has organized a MLPA South Coast Regional Stakeholder Group to re-examine and re-design the Marine Protected Areas in southern California, to increase their coherence and effectiveness at protecting the State's marine life, habitat, and ecosystems.

On March 25, 2005, the California Fish and Game Commission adopted the MSFMP (California Fish and Game Commission 2005, pp. 1-558), which: (1) Limits the wattage of attracting lights (see Factor E below) to a maximum of 30,000 watts per boat; (2) requires that attracting lights be shielded to direct the light downward, or situated such that the illumination is completely submerged underwater; and (3) and prohibits, at any time, the use of attracting lights for the purpose of taking of market squid in all waters of the Gulf of the Farallons NMS, that encompasses all of the ashy storm-petrels on Southeast Farallon Island and approximately 36 to 53 percent of the ashy storm-petrels rangewide.

Mexican Federal Protection

The ashy storm-petrel is currently listed as threatened under Mexican Law, NOM-059-ECOL-2001, and is proposed as endangered under a draft amendment of this law (SEMARNAT 2008, p. 39). Pursuant to this law, general criteria are to be followed in managing Mexican wildlife, including, but not limited to: preservation of biodiversity and natural species habitats; and preservation of endemic, threatened, endangered or specially protected species. These considerations apply to all of the ashy storm-petrels found in Mexico, which constitutes approximately 1 to 2 percent of the rangewide population. We have no new information on the adequacy and effectiveness of ''threatened'' or ''endangered'' status for conservation of ashy storm-petrels in Mexico.

International Agreements

Since the ashy storm-petrel ranges into Mexico, international agreements may provide some protections for the species. The North American Agreement on Environmental Cooperation (NAAEC) was negotiated and is being implemented in parallel to the North American Free Trade Agreement. NAAEC requires that each Party (United States, Mexico, and Canada) ensure that its laws provide for high levels of environmental protection. Each Party agreed to effectively enforce its environmental laws through appropriate means, such as the appointment and training of inspectors, monitoring compliance, and pursuing the necessary legal means to seek appropriate remedies for violations. The Commission for Environmental Cooperation (CEC) was created under the NAAEC and is authorized to develop joint recommendations on approaches to environmental compliance and enforcement.

Summary of Factor D

Based on our analysis of the existing regulatory mechanisms, we have found a diverse network of laws and regulations that provide protections to the ashy storm-petrel and its habitat and effectively ameliorate threats rangewide. Specific to the ashy storm-petrel, provisions of the MBTA prohibit killing or possessing of the species. An overarching protection of breeding and foraging habitat through Federal nexuses in regulatory mechanisms, such as the Outer Continental Shelf Lands Act, Federal Power Act, Oil Pollution Control Act, and the Deepwater Port Act, provide protections to breeding and foraging habitat. At Southeast Farallon Island all of the breeding locations are located on U.S. Fish and Wildlife Service, National Wildlife Refuge System lands which are covered under the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-668ee). Additionally, the waters surrounding Southeast Farallon Island are within the Gulf of the Farallons NMS, where there is a prohibition on the use of attracting lights for market squid fishing. In the Channel Islands, approximately 16 percent of the breeding habitat is off limits to the use of attracting lights for market squid fishing due to the provisions of the National Marine Sanctuaries Act. Additionally, some sea caves on Santa Cruz Island have been closed to human visitation and the National Park Service is planning to develop and implement a island spotted skunk and nonnative mouse management plan that will provide additional protections to the ashy storm-petrel. Approximately 99 percent of the ashy storm-petrel breeding locations in the Channel Islands are located on National Park Service lands, which are covered under the National Park Service Organic Act. Regulatory mechanisms under the State of California, including CEQA, MLPA, and provisions under MSFMP, provide additional protections for the ashy storm-petrel. Based on our review of the best available scientific information, we conclude that adequate regulatory mechanisms are in place to protect the species and its habitat throughout its range, within the Channel Islands, and at Southeast Farallon Island.

Factor E: Other Natural or Manmade Factors Affecting the Continued Existence of the Species

The petitioner asserts that artificial light pollution due to California market squid fishery boats, and current and future offshore energy production platforms, threatens the continued existence of the ashy storm-petrel (CBD 2007, pp. 15-17). In addition, the petitioner claims that contamination from petroleum (from offshore energy production platforms and ocean-going vessels), chlorinated hydrocarbons, and plastics threaten the continued existence of the ashy storm-petrel (CBD 2007, pp. 18-20).

Artificial Light Pollution at Breeding Colonies – Market Squid Fishery and Tuna Aquaculture

The California market squid is found from central Baja California, Mexico, to Southeast Alaska (Roper and Sweeney 1984, p. 95-96). In California, a fishery for market squid consists of two geographically distinct components: a central California fishery off Monterey and a southern California fishery around the Channel Islands and along the mainland coast (Pomeroy and Fitzsimmons 2001, p. 3). The Service is not aware of the occurrence of market squid fishery activities at Islas Los Coronados and Islas Todos Santos, which are known ashy storm-petrel breeding locations in Mexico.

Market squid spawn in sandy substrates near islands and the coast (California Fish and Game Commission

2005, p. 37). Harvest involves luring the squid to the surface with high wattage lamps, encircling them with purse seine nets, pumping and using nets to remove the squid from the water, and finally storing them in an on-vessel fish hold (Hastings and MacWilliams 1999, p. iv).

Market squid fishery activities occur during squid mating and egg-laying: April through October in central California, and October through May in southern California (Pomeroy and Fitzsimmons 2001, pp. 2-3; California Fish and Game Commission (2005, p. 37). Market squid fishery activities coincide with the peak fledging period (early to mid-October) and pre-egg and early egg-laying periods of ashy storm-petrels (February through May) (Ainley 1995, p. 5; McIver 2002, p. 17).

According to the MSFMP (2005, p. 3), squid may not be taken using attracting lights in all waters of the Gulf of the Farallones National Marine Sanctuary at any time; this closure includes Southeast Farallon Island. In addition, squid fishery activities are not permitted within 11 marine reserves and 2 marine conservation areas in southern California, which collectively contain seven ashy storm-petrel breeding locations. In California, market squid fishery activities are permitted at 13 ashy storm-petrel breeding locations. Although we are not aware whether market squid fishing occurs at ashy storm-petrel breeding locations in Mexico, we are aware of aquaculture activities associated with the harvest of northern bluefin tuna (*Thunnus orientalis*) at Islas Los Coronados and Islas Todos Santos, Mexico, which use bright lights to illuminate at-sea tuna pens (Zertuche-Gonzáles *et al.* 2008, p.14; McIver, personal observation). Therefore, bright lights associated with commercial fishing activities (market squid fishery and tuna aquaculture) are permitted at 15 locations that collectively comprise approximately 1,915 breeding ashy storm-petrels, which is approximately 25 percent to 34 percent of all breeding ashy storm-petrels, depending on population estimates used.

Evidence from several studies, anecdotal observations, and museum specimens indicate that ashy storm-petrels and related species are attracted to lights, which puts them at risk for light-induced mortality (Reed *et al.* 1985, pp. 377-383; Le Corre *et al.* 2002, pp. 93-102). In their study of four species of procellariids (specifically, Barau's petrel (*Pterodroma baraui*), Mascarene petrel (*Pseudobulweria aterrima*), Audubon's shearwater (*Puffinus lherminieri bailloni*), and wedge-tailed shearwater (*Puffinus pacificus*)) on Réunion Island in the Indian Ocean, Le Corre *et al.* (2002, p. 93) reported that birds that collided with lights then fell to ground with fatal injuries, were killed by predators, or died of starvation, and that 94 percent of these procellariids were juveniles. Light-induced collisions and mortality of storm-petrels at breeding locations have been reported by researchers. James-Veitch (1970, p. 40) reported that ashy storm-petrels collided with a lamp post on Southeast Farallon Island. Wolf (2008, p. 8) reported personal observations of storm-petrels flying around the lighthouse light at West San Benito Island, Mexico, a breeding location for Leach's and least storm-petrels. She also observed many hundreds of dead storm-petrels that had accumulated below the window that enclosed the lighthouse light, after attraction to the light and apparent collision with the glass. The period over which the storm-petrels collided with and accumulated under the window is unknown. Additionally, we are aware of 15 museum specimens of ashy storm-petrels that were collected at lighted offshore energy platforms (n = 2) or brightly lit coastal mainland locations (n = 13) (Carter *et al.* 2000, p. 443; Ornithological Information System [ORNIS] 2008), and ashy storm-petrels have been observed circling bright lights at a coastal mainland sporting venue on several occasions (Capitolo 2005, 2008; LeValley 2008) (see following ''At-sea Artificial Light Pollution - Offshore Energy Platforms'' section). These museum collections and direct observations demonstrate that ashy storm-petrels are attracted to light that occurs far from ashy storm-petrel breeding locations, where attendance by storm-petrels is lower than at breeding locations. Therefore, it is reasonable to assume that near breeding locations ashy storm-petrels are similarly attracted to commercial fishery lights, and that mortality of ashy storm-petrels as a result of this attraction, although not quantified, likely occurs.

Several researchers (Gross [1935, p. 387]; James-Veitch [1970, p. 65]; Ainley [1995, p. 5]) have reported decreases in the amount of aerial activities by storm-petrels at night at their nesting grounds on bright, moonlit nights. Watanuki (1986, pp. 14-22) showed that colony activity levels of Leach's storm-petrels were inversely correlated with light intensities and the corresponding risk of predation by slaty-backed gulls (*L. schistisagus*). Oro *et al.* (2005, p. 425) reported that predation of European storm-petrels (*Hydrobates pelagicus*) by yellow-legged gulls (*L. michahellis*) was much higher at a cave that received stronger illumination from the city of Benidorm, Spain, located approximately 1.9 mi (3 km) from the storm-petrel colony. Data in Keitt (2004, p. 176) supported their hypothesis that a function of nocturnal activity patterns in the black-vented shearwater (*Puffinus opisthomelas)* was reduction in the likelihood of predation by western gulls. Since procellariids have been shown to use the cover of darkness as a defense against predation at their nesting colonies, it is paradoxical that procellariids, including storm-petrels, are also attracted to bright lights (Montevecchi 2006, p. 94). Imber (1975, p. 305) suggested that the attraction of procellariids to bright lights is an artifact of their visual cueing towards bioluminescent prey.

Our review of the available information revealed no direct observations or evidence of mortality of ashy storm-petrels through attraction to squid fishery lights; however, examining measures of reproductive success provides indirect evidence of an effect of squid fishery lights on ashy storm-petrels at breeding locations. From 1992 to 2000, Maxwell *et al.* (2004, p. 665) documented intense market squid harvesting near Santa Rosa, Santa Cruz, Anacapa, and Santa Catalina islands. During October 1995, 1996, and 1997, squid fishing activity was relatively high along the north coast of Santa Cruz Island from the west end to Orizaba Rock (Maxwell *et al.* 2004, p. 668). At Orizaba Rock, the number of active storm-petrel nest sites was 60 percent and 75 percent lower in 1997 than in 1995 and 1996, respectively (McIver *et al.*, in preparation), and the numbers of active nests (counted during mid-summer surveys) declined significantly (10 percent per year) from 1996 through 2005 (Carter *et al.* 2007, p. 7). However, the number of ashy storm-petrel nests at Orizaba Rock increased in 2006 and 2007 (Carter *et al.* 2007, p. 7; McIver *et al.* 2008, p. 6). Reasons for an increase in numbers of active nests at Orizaba Rock are not fully understood and may reflect reduced use of bright night lights, movements of some adult storm-petrels from Bat Cave after skunk predation in 2005, and other factors (McIver *et al.* in preparation). Human disturbance of nest sites on Orizaba Rock has not been documented, so this may not explain the reduction of nests from 1996 to 2005. Based on our conclusion that ashy storm-petrels are less affected by such environmental factors as reduced ocean productivity, and the study by Adams and Takekawa (2008, p. 14) that showed that ashy storm-petrels captured at three separate breeding locations in southern California forage in similar areas of ocean, we believe it is unlikely that oceanographic conditions explain the reduced reproductive success and numbers of nests of ashy storm-petrels at Orizaba Rock. Our review of the available information suggests that bright lights used in the market squid fishery at Orizaba Rock may have been a factor in the observed decline in numbers of active nests from 1996 through 2005, and low reproductive success observed there in 1996 and 1997. However, our review of available information did not reveal any data regarding the reproductive success or mortality rates of ashy storm-petrels at other Southern California locations, such as Santa Barbara Island and adjacent Sutil Island, where larger numbers of ashy storm-petrels nest than at Oriziba Rock. The absence of any data at these locations does not permit a meaningful or reliable extrapolation of trends regarding ashy storm-petrel reproductive success and numbers of active nests observed at Orizaba Rock, including the possible effects of squid fishery lights at that location, or to other ashy storm-petrel nesting locations in Southern California.

Acknowledging the potential for impacts to breeding seabirds, the MSFMP requires that squid fishery boats in California limit wattage (per boat) to 30,000 watts maximum and maintain shields on lights that are parallel to the deck of the vessel (MSFMP 2005, Section 1-ii) in order to reduce the potential for predation as a result of illumination of seabird breeding locations on islands adjacent to fishing locations. However, ambient and artificial light intensity at seabird (including ashy storm-petrel) breeding locations in California has not been studied, and therefore the efficacy of the MSFMP measures to reduce potential predation associated with illumination at islands is not known.

Measures to reduce the potential for predation as a result of illumination of seabird breeding locations, such as reduced wattage of lights and reduced upward radiation of light, are likely less effective in reducing the potential for attraction and collision of ashy storm-petrels that approach lighted fishing boats. While foraging and while in transit, ashy storm-petrels fly from a few centimeters (inches) to a few meters (yards) over the surface of the ocean, and upon approaching lighted boats, are exposed to the lights. Mortality to breeding and non-breeding ashy storm-petrels could occur through direct collision with lights, and ashy storm-petrels, exhausted after constant circling of lights, could be susceptible to predation by gulls, which are also known to concentrate around lighted squid fishery boats, presumably to feed on squid (Shane 1995, p. 10; W. McIver, personal observation). Two dead ashy storm-petrels were collected from boats at sea off the coast of southern California, presumably due to attraction to bright lights (ORNIS 2008).

Squid fishery activities also occur in the southern part of Monterey Bay between Point Pinos and Fort Ord (Recksiek and Frey 1978, p. 9). Market squid fishing in general coincides with spawning events, and in central California squid spawning occurs from April to October (CDFG 2005, pp. 1-21). During autumn months (generally September and October), thousands of ashy storm-petrels congregate in the bay in deeper waters over the Monterey Submarine Canyon (Roberson 1985, p. 43); depending on location, flocks generally occur 3 to 25 mi (5 to 40 km) away from squid fishing areas. Shearwater Journeys, a bird-watching concessionaire in Monterey, California, observed large flocks (estimated 7,000 to 10,000 birds) of ashy storm-petrels in September 2008 on Monterey Bay (Shearwater Journeys 2008, *http://www.shearwaterjourneys.com/index.shtml*). Based on known attraction of storm-petrels to boats and brightly lit facilities on the mainland, there is the potential for ashy storm-petrels in the large flocks to be attracted to these lights if boats are present at night in Monterey Bay during autumn months. Assuming a total population of 10,000 ashy storm-petrels, and autumn flock sizes of 4,000 to 7,000 ashy storm-petrels in Monterey Bay, approximately 40 percent to 70 percent of the total population of ashy storm-petrels theoretically could be exposed to this potential threat. This estimate includes ashy storm-petrels that come from Southeast Farallon Island only at this time of year for a short time. However, market squid fishing in Monterey Bay is largely observed to occur during daylight hours (CDFG 2008b, p. 20; Pacific Fishery Management Council 2008, p. 44) rather than at night, when ashy storm-petrels exclusively feed. While attracting lights may be used during daylight hours in this fishery, because ashy storm-petrels exclusively feed at night we do not expect that ashy storm-petrels are significantly affected by the market squid fishery in Monterey Bay. As stated above, we have no data indicating any ashy storm-petrel mortality associated with market squid fishing in Monterey Bay and are aware of only two dead ashy storm-petrels collected from boats at sea off of the Southern California coast. Accordingly, based on our review of the available information regarding light pollution from market squid fishery boats and tuna farms near ashy storm-petrel breeding colonies, we conclude that some low level of mortality of ashy storm-petrels may be occurring as a result of squid fishery lighting, resulting in a temporaily reduced number of birds within limited geographic locations.

Approximately 26 percent to 34 percent of the total ashy storm-petrels at breeding locations may be exposed to lighting. This estimate does not include ashy storm-petrels at Southeast Farallon Island, where squid fishing is prohibited. However, available data does not indicate that the potential threat from bright lights is causing significant mortality to the overall population of ashy storm-petrels. Further, our review of the available information does not suggest that the threat of fishery-related lighting is expected to increase to any large degree in the foreseeable future due to implementation of regulations limiting wattage of lighting and location of fishing activities. While not basing our conclusion on this factor, we are aware that the State of California has issued regulations that limit the wattage of lighting and location of fishing activities. Therefore, we do not consider artificial light pollution from the market squid fishery or tuna aquaculture operations to be a significant threat to ashy storm-petrels at breeding colonies anywhere within the species' range at this time.

At-sea Artificial Light Pollution - Offshore Energy Platforms

The petitioner asserts that the ashy storm-petrel's marine environment is being (and will be) modified and degraded by artificial light pollution from current (and future) offshore energy platforms (oil production platforms and liquefied natural gas (LNG) terminals) and vessels (CBD 2007, pp. 15-16). Specifically, the petitioner claims that ashy storm-petrels are (or would be) attracted to bright lights and die from exhaustion after constant circling of the lights, or die by direct collision with the lights or platforms.

Offshore oil operations in California are conducted from 23 platforms in Federal waters (greater than 3 mi (4.8 km) from shore) and 10 platforms and related facilities in State waters (less than 3 mi (4.8 km)), distributed over an area of about 7,700 square mi (20,000 square km) along the southern coast of the State (McCrary *et al.* 2003, p. 43).

All of the currently operational platforms occur within the at-sea range of foraging ashy storm-petrels (Briggs *et al.* 1987; p. 23 Mason *et al.* 2007, pp. 56-59; Adams and Takekawa 2008, pp. 12-13). Offshore oil production platforms in California are illuminated at night by bright, incandescent lights that serve as maritime navigational aids and illuminate working platforms and walkways.

Russell (2005, pp. 1-330) studied the interactions between migrating birds and offshore oil and gas platforms in the northern Gulf of Mexico; however, our review of the available information did not reveal any surveys that have been conducted to assess storm-petrel (or other bird species) attraction to oil production platforms off the coast of California, or any direct observations of ashy storm-petrels flying around the lights of offshore oil production platforms. However, Carter *et al.* (2000, p. 443) reported two specimens of ashy storm-petrels (archived at the Santa Barbara Natural History Museum, Santa Barbara, California (SBNHM)) that were recovered dead on an offshore oil platform (Platform Honda), located approximately 5 mi (8 km) off the coast of southern California. Ashy storm-petrels have also been collected dead from mainland locations with bright lights, indicating that the birds were attracted to and died as result of association with bright lights. Carter *et al.* (2000, p. 443) reported six ashy storm-petrel carcasses (also archived at SBNHM) that were recovered from six mainland locations (from Goleta to Point Mugu) with bright lights in southern California. The Service is aware of at least seven additional museum specimens of ashy storm-petrels that were collected at mainland locations in California with bright lights; all were collected during autumn months (Ornithological Information System [ORNIS] 2008). Ashy storm-petrels have also been observed flying at night around bright lights at a stadium adjacent to San Francisco Bay on several occasions during autumn months over the past several years (Capitolo 2005, 2008; LeValley 2008). LeValley (2005, 2008) described the storm-petrels as juveniles, based upon plumage characteristics, and observed on at least two occasions that the storm-petrels flew to and landed in the lights.

The museum specimens are evidence that ashy storm-petrels are attracted to bright lights, even those that occur in metropolitan areas, far from their at-sea foraging range. This indicates that bright lights on oil production platforms that occur within their marine range likely attract more ashy storm-petrels than are indicated by random collection and museum records. The direct observations of ashy storm-petrels around bright lights during autumn months support an examination by Imber (1975, p. 304), who states that juvenile procellariids are likely attracted to lights more often than adults. Similarly, most of the museum specimens from mainland locations and the offshore platforms were collected in the fall and may have been juvenile birds. In a study of migratory passerine birds in the Gulf of Mexico, Russell (2005, p. 4) reported that offshore platforms attract birds, induce nocturnal circulations of platforms and result in mortality of birds through collision. This is commensurate with reported observations of ashy storm-petrels flying around and into bright lights at coastal mainland sporting events. Field demonstration tests on an offshore oil platform in the North Sea, involving the exchange of lighting with a greenish light, and reductions in lighting, have been shown to reduce passerine bird occurrence at the platform by 50 to 90 percent (Marquenie and van de Laar 2004, p. 6; Marquenie *et al.* 2008, pp. 2-4). Our review of the available information did not find any similar demonstration on oil production platforms in southern California.

Two LNG projects are proposed off the coast of southern California (California Energy Commission 2009). The proposed Clearwater Port Project (owned by Northern Star Natural Gas Inc.) would be located approximately 13 mi (21 km) offshore of the City of Oxnard, Ventura County, in the Santa Barbara Channel. Clearwater Port would reconfigure an existing offshore oil production platform (Platform Grace). Reconfiguration of the platform would involve installing an LNG transfer system, a cool down system, pumps, and ambient air vaporizers, and reinstalling and upgrading the platform's power-production capability. The proposed Port Esperanza (owned by Esperanza Energy, LLC, a subsidiary of Tideland Oil & Gas Corporation) would be located approximately 15 mi (24 km) south of the port of Long Beach, and would include two unmoored, self-propelled, re-gasification units, each connected to its own permanently moored buoy. The application for a third LNG project, the Oceanway LNG Terminal Project, was withdrawn by Woodside Petroleum Ltd., in January 2009 (Woodside Petroleum Ltd. 2009, pp. 1-2). Our review of the available information did not find specific plans that describe the lighting configurations of these proposed terminals, but assumes that lighting configurations and intensities would be similar in nature to current offshore oil platforms in California.

As stated earlier, Le Corre *et al.* (2002, p. 97) found that the geographic distribution of the mortality to Barau's petrel (due to attraction to bright lights at night) depended on location of urban and industrial areas in relation to the distribution of breeding colonies. At Réunion Island, light sources were urban, stationary, and functioned (at night) continuously (Le Corre *et al.* 2002, p. 96). In southern California, continuously functioning sources of light include extensive mainland metropolitan areas, and 33 offshore oil production platforms (McCrary *et al.* 2003, p. 43). The oil production platforms are located within 150 mi (240 km) of all southern California ashy storm-petrel breeding locations, well within the distance from breeding colonies that the species has been observed to forage (220 mi [360 km]) (Adams and Takekawa 2008, p. 13). Accordingly, we conclude that about 50 percent of the total population of ashy storm-petrels (approximately 100 percent of the ashy storm-petrels that breed in the California Channel Islands) may be exposed to this potential threat. In summary, based on observations of ashy storm-petrels collected dead from an offshore oil platform and from brightly lit mainland locations, and recent observations of ashy storm-petrels observed in association with bright lights at a sporting facility, we have information that ashy storm-petrels are susceptible to bright lights on current structures that occur in their oceanic environment. This threat likely results in some (but unknown) level of mortality. At this time, the existing population information does not indicate that mortality associated with offshore energy platforms is a significant threat to the species at Southeast Farallon Island, at the Channel Islands, or rangewide. However, should offshore energy development increase significantly in the future, it would likely be appropriate to monitor and provide conservation measures that would eliminate or minimize the potential for mortality.

Oil Pollution – Offshore Energy Production Platforms

The largest oil spill from offshore oil operations in California was the 80,000-barrel (3,360,000-U.S. gallon) Santa Barbara spill from Platform A in 1969, which resulted in the death of thousands of birds (McCrary *et al.* 2003, p. 46). Since 1969, only one spill from oil and gas operations offshore of

California has resulted in documented seabird mortality (more than 700 birds), the 163-barrel (7,000-gallon) Platform Irene pipeline spill, off Point Arguello in 1997 (Torch/Platform Irene Trustee Council 2007, p. 3; McCrary *et al.* 2003, p. 46). Oiled ashy storm-petrels were not documented during either of these spills. Applying information on estimated spill size and spill probability to potential impacts on seabirds is difficult because of many factors, including the type, rate, location, and volume of oil spilled, weather and oceanographic conditions, timing within year of the spill, distribution of seabird species near a spill, and behavior of seabirds in reaction to oil slicks (Ford *et al.* 1987, p. 549; McCrary *et al.* 2003, p. 46). Minerals Management Service (2001, p. xix) reported that without the development of 36 currently undeveloped leases, the probabilities that one or more oil spills will occur from existing Outer Continental Shelf oil and gas activities (during years 2002 to 2030) are 73.9 percent for a spill of 200 barrels (8,600 U.S. gallons) or less, and 59.1 percent for a spill of 2,000 barrels (86,000 U.S. gallons).

A Federal moratorium on offshore drilling and platform development off the coast of California was initiated by the U.S. Congress in 1982 (U.S. Department of Energy 2005). On October 1, 2008, the 1982 offshore drilling moratorium expired and was not renewed by the U.S. Congress. On September 16, 2008, the U.S. House of Representatives passed bill H.R. 6899, the Comprehensive American Energy Security and Consumer Protection Act, which would allow oil and natural gas exploration and production between 50 and 100 mi (80 and 161 km) off the U.S. coasts. The U.S. Senate has received but not yet voted on H.R. 6899. Fossil fuel (such as petroleum and natural gas) energy use and production is and will likely continue to be a significant societal issue for the United States in the foreseeable future. Consequently, it is foreseeable that within the next 15 years, additional offshore oil and gas platform development will occur off the California coast, within the marine range of ashy storm-petrels.

Based on information available to the Service regarding offshore oil production, we conclude that about 50 percent of the total population of ashy storm-petrels could potentially be exposed to oil spills. However, predicting the possible effects of an oil spill from an offshore energy production platform is difficult and would depend on the timing and amount of a spill, prevailing ocean currents and conditions, and locations of ashy storm-petrels at the time of a spill. We conclude that a relatively small proportion of the population would likely be exposed to any single oil spill, and consequently oil spills are not considered to be a significant threat to ashy storm-petrels anywhere within the species' range.

Oil Pollution - Vessels

Hampton *et al.* (2003, p. 29) summarized previous reports and showed that, during the 20th century, hundreds of thousands to millions of seabirds, especially common murres (*Uria aalge*), were killed by oil pollution from oil tankers and other marine vessels in central California. Hampton *et al.* (2003, p. 30) estimate that approximately 20 tankers per week arrive at and depart ports in California. In California, large oil transfer facilities occur in San Francisco Bay and Long Beach Harbor (Los Angeles) (California Resources Agency 2008, p. 5F-6). Ports for non-tanker marine vessels (e.g., dredges, cargo vessels) occur at numerous locations along the California and northwestern Baja California coasts. Tankers traveling along the coast, in accordance with a voluntary agreement with California State and U.S. Federal agencies, stay about 50 mi (80 km) offshore (Hampton *et al.* 2003, p. 31). Hampton *et al.* (2003, p. 30) showed that oil spill accidents regarding non-tanker vessels are the most common in California, and that small volumes of oil may kill large numbers of birds. In an examination of shipping practices, Hampton *et al.* (2003, pp. 30-32) suggested that the dumping of tanker washings could occur several times per week off the California coast, regular tank washings could produce the equivalent of a small (~10,000-U.S. gallon) oil spill, and that dumping of tanker washings could pose a greater threat to offshore (e.g., greater than 50 mi (80 km) out) seabird species, including ashy storm-petrels, than to species occurring closer inshore. Minerals Management Service (2001, p. xix) reported a 90.5 percent probability of a 22,800-barrel (957,600 U.S. gallons) tanker spill occurring in waters of the Outer Continental Shelf during 2002 to 2030.

Oiled ashy storm-petrels have been collected in California. Two ashy storm-petrels were collected between 1997 and 2003, in association with "mystery spills" attributed to the *S.S. Jacob Luckenbach*, which sank in the Gulf of the Farallones in 1953 and leaked oil as it decayed on the ocean floor (Luckenbach Trustee Council 2006, pp. i, 65). Major oiling events attributed to the *S.S. Luckenbach* occurred every few years from 1973 through 2002 (Luckenbach Trustee Council 2006, pp. i, 65). Small seabirds (including ashy storm-petrels) may be more susceptible to mortality due to predation after oiling, and the degree of at-sea loss is likely higher with offshore species (Ford *et al.* 1987, pp. 549-550). Although specific mortality for ashy storm-petrels was not estimated during the *S.S. Luckenbach* spill event, it was presumed that the ratio of actual dead to recovered dead was similar to that of ancient murrelets (*Synthliboramphus antiquus*) and Cassin's auklets, and that total mortality for ashy storm-petrels was approximately 21 individuals (Luckenbach Trustee Council 2006, p. 65).

Based on information available to the Service regarding oil tanker traffic off the coast of California, ashy storm-petrels are exposed to the threat of oil spills. In addition, because oiled ashy storm-petrels have been recovered from vessel-related spills (the *S.S Luckenbach*), we know that the species is susceptible to oiling. Predicting the possible effects of an oil spill from tankers is difficult and would depend on the timing and amount of a spill, prevailing ocean currents and conditions, and locations of ashy storm-petrels at the time of a spill. Since thousands of ashy storm-petrels congregate in Monterey Bay every fall, the species could be vulnerable to a tanker spill near Monterey Bay at that time of year. However, the Service has no information indicating that tanker spills in the Monterey Bay are predictable or even likely. Therefore, we consider oiling from tanker spills to be insignificant to ashy storm-petrels anywhere within the species' range.

Organochlorine Contaminants

The petitioner asserts that the ashy storm-petrel is threatened or endangered by the presence, in the marine environment, of organochlorine pollutants—specifically, dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs), and their breakdown products (CBD 2007, p. 18). The petitioner asserts that, as a result of the presence of these pollutants in the waters off California, eggshell thinning occurred in collected eggs of the ashy storm-petrel, and reproductive success of the species has been reduced (CBD 2007, p. 19).

During the period from the late 1940s to the early 1970s, Los Angeles area industries discharged and dumped thousands of tons of DDT and PCBs into ocean waters off the Southern California coast (Department of Commerce 2001, p.

51391). Almost all of the DDT originated from the Montrose Chemical Corporation's manufacturing plant in Torrance, California, and was discharged into Los Angeles County sewers that empty into the Pacific Ocean at White Point, on the Palos Verdes shelf (Department of Commerce 2001, p. 51391). In addition, large quantities of PCBs from numerous sources throughout the Los Angeles basin were released into ocean waters through the Los Angeles County sewer system (Department of Commerce 2001, p. 51391).

Most organochlorine pesticides are hydrophobic (meaning that they tend not to combine with, or are incapable of dissolving in water) and show a high affinity for lipids (Portman and Bourne 1975, p. 294). Bioaccumulation is defined as an increase in the amount of a substance in an organism or part of an organism that occurs because the rate of intake exceeds the organism's ability to remove the pesticide from the body (Holland 1996, p. 1170). Biomagnification is defined as the bioaccumulation of a pesticide through an ecological food chain by transfer of residues from the diet into body tissues, in which the tissue concentration increases at each trophic level in the food web (Holland 1996, p. 1171). Storm-petrels feed on prey that occur at the ocean's surface and that contain high concentrations of lipids, such as euphausiids, larval fish, fish eggs, and squid (Watanuki 1985, p. 885; Warham 1990, p. 186). As mentioned in the **Species Description** section above, the diet of ashy storm-petrels has not been well-studied, but likely includes euphausiids, larval fish, and fish eggs, which would make ashy storm-petrels susceptible to bioaccumulation and biomagnification.

Eggshell thinning caused by DDE (dichlorodiphenyldichloroethylene, a metabolite of DDT), which results in eggs getting crushed during incubation and thus breeding failure of many fish-eating birds, is probably the best documented effect of environmental pollutants on birds (Fry 1995, p. 168). DDT-induced eggshell thinning caused reproductive failures of brown pelicans, bald eagles, and peregrine falcons in the California Channel Islands (Hickey and Anderson 1968, pp. 271-273; Risebrough *et al.* 1971, pp. 8-9; Gress *et al.* 1973, pp. 197-208).

Coulter and Risebrough (1973, pp. 254-255) first reported eggshell thinning in the ashy storm-petrel in the early 1970s. Ashy storm-petrel eggs were also collected for contaminant analyses and measurements of eggshell thinning in 1992 (Fry 1994; Kiff 1994), 1995-97 (D. Welsh, unpublished data), and 2008 (Cater *et al.* 2008). For eggs collected in 1992, the highest levels of total DDT and PCBs, relative to other seabird species, were contained in ashy storm-petrel eggs, and the averages for total DDT and PCBs in ashy storm-petrel eggs were the highest measured for any of the 13 species that were examined, and measured almost twice the levels observed in the second-most contaminated eggs (Fry 1994, p. 30). Kiff (1994, pp. 1-29) compared eggshell thicknesses of ashy storm-petrel eggs that were collected before 1947 (pre-contamination reference material) to eggshell thicknesses of eggs collected in 1992 and reported that 27.8 percent of the ashy storm-petrel eggs collected from Santa Cruz Island (n = 18) were 15 percent thinner than the pre-1947 average. Concentrations of DDE in ashy storm-petrel eggs have been linked with eggshell thinning and lower hatching success (Carter *et al.* 2008c, p. 4). Based on findings from 12 ashy storm-petrel eggs collected in 2008, Carter *et al.* (2008, p. 4) reported statistically significant declines ($p<0.0001$) in levels of DDE and PCBs in ashy storm-petrel eggs collected in 2008, compared to eggs collected in the 1990s. Data are currently not available on eggshell thicknesses of ashy storm-petrel eggs collected in 2008, but the Service anticipates that additional work will be funded in 2009 to further analyze organochlorine contaminant data and examine changes in eggshell thinning in randomly collected and salvaged eggs.

Carter *et al.* (2008, p. 5) speculated organochlorine contaminant concentrations from the 1960s to the 1980s were greater in ashy storm-petrels, as compared to other breeding seabirds in southern California, such as brown pelicans (*Pelecanus occidentalis*) and double-crested cormorants (*Phalacrocorax auritus*). Organochlorine contaminant levels and reproductive success of ashy storm-petrels in southern California were not measured or monitored prior to the 1990s; however, Carter *et al.* (2008, p. 5) suggest that higher organochlorine concentrations may have contributed to lower hatching success and lower population size of ashy storm-petrels in southern California during the 1960s to 1980s than observed in the 1990s. During 1995 to 1997, a higher proportion of broken eggs were found than in 2005 to 2007 (McIver *et al.* in preparation). McIver *et al.* (in preparation) reported that hatching success at Santa Cruz Island differed significantly among years, with lowest success in 1996 (53.5 percent, n = 187) and highest success in 2006 (82.0 percent, n = 61). McIver *et al.* (in preparation) speculated that DDE-induced eggshell thinning likely contributed to lower hatching success at Santa Cruz Island from 1995 to 1997 and likely explained (in part) the relatively high proportion of broken eggs found at all Santa Cruz Island locations monitored. Carter *et al.* (2008, p. 5) concluded that DDE and total PCBs decreased to much lower levels between 1992 and 2008, and that, from 1992 to 1997, relatively high contaminant levels and associated eggshell thinning and premature embryo deaths likely were significant contributing factors to relatively low hatching success observed during this period.

Based on information available to the Service regarding organochlorine contamination of ashy storm-petrels, ashy storm-petrels have been exposed (likely, through their food resources) to organochlorine contaminants throughout their foraging range, but this exposure has likely been greater for ashy storm-petrels breeding in southern California and foraging in nearby waters. We conclude that organochlorine contaminants are still present in ashy storm-petrels, but preliminary results indicate that current levels of contaminants are much reduced compared to levels observed in the 1990s. In addition, fewer numbers of broken eggs and higher hatching success of ashy storm-petrels at Santa Cruz Island may be explained, in part, by reduced organochlorine contamination. Therefore we consider this threat to be insignificant to ashy storm-petrels at Southeast Farallon Island, at the Channel Islands, or rangewide.

Ingestion of Plastics

The petitioner asserts that the ashy storm-petrel is threatened by the ingestion of plastic particles floating at the ocean's surface (CBD 2007, pp. 20-21). Ingestion of plastics by seabirds is well-documented, and plankton-feeding seabirds, such as ashy storm-petrels, are more likely to confuse plastic pellets for their prey than are fish-eating seabirds; therefore, the plankton-feeding seabirds show a higher incidence of ingested plastics (Azzarello and Van Vleet 1987, p. 295). Two studies have documented the presence of plastic particles in storm-petrel species that foraged in waters of the California Current. Blight and Burger (1997, p. 323-324) dissected seabirds caught as bycatch in the eastern North Pacific; they found plastic in all eight storm-petrel (Leach's and fork-tailed) carcasses they collected, and the number of pieces of plastic in each bird was highest for the two species of storm-petrels and in a Stejneger's petrel (*Pterodroma longirostris*). Shuiteman (2006, p. 23) found plastic particles in regurgitation samples of Leach's storm-petrels caught in mist nets on Saddle Rock, Oregon.

At-sea surveys for plastic particles off the coast of southern California (Moore *et al*. 2004, pp.1-6) in 2000 and 2001 are the only research that the Service is aware of that has attempted to quantify the amount of plastics observed in waters within or near the foraging range of ashy storm-petrels. Moore *et al*. (2004, pp. 2-3) reported densities of up to 7.25 pieces per cubic meter of water sampled for plastic pieces that were less than about 0.2 inches (5 millimeters) in diameter. As stated in the **Species Description** section above, like other storm-petrel species, ashy storm-petrels feed by picking prey from the surface of the ocean. Because plastic ingestion by storm-petrels has been well-documented, we assume that ashy storm-petrels also ingest plastic. However, the incidence of plastic ingestion by ashy storm-petrels has not been specifically evaluated (such as by necropsy or analysis of regurgitations). In addition, plastic ingestion has not been reported as a cause of death of ashy storm-petrel chicks or adults (Ainley *et al*. 1990, pp. 128-162; McIver 2002, pp. 17-49), and the degree to which the ingestion of plastic may affect ashy storm-petrels is not known (Ainley 1995, p. 9).

Based on information available to the Service regarding the presence and availability of plastic particles in the marine environment used by ashy storm-petrels, and the propensity for storm-petrels to ingest plastic, we recognize that nearly all ashy storm-petrels have the opportunity to ingest plastic, but we have no information on the rate of ingestion. We also recognize plastic particles will continue to be ubiquitous in the future in the waters of the California Current, where ashy storm-petrels feed. Although plastic ingestion has been observed in other species of storm-petrels and likely occurs with ashy storm-petrels, our review of the available information revealed no direct evidence that suggests ashy storm-petrels are currently being negatively affected by this potential threat. Therefore, we consider this threat to be insignificant to ashy storm-petrels at Southeast Farallon Island, at the Channel Islands, or rangewide.

Summary of Factor E

Regarding other natural or manmade factors affecting the continued existence of the species, the Service concludes that the presence of bright lights associated with commercial fishing operations (for example, market squid fishery and tuna aquaculture) at ashy storm-petrel breeding locations and (to a lesser extent) near large at-sea congregations of ashy storm-petrels, causes mortality in adult and fledgling ashy storm-petrels through direct collision with lights and predation, but is unlikely to affect the species at a population level.

The Service concludes that the presence of constantly shining lights (at night) on oil and gas production platforms (current and future) off the California coast, causes mortality in foraging ashy storm-petrels, which may collide with lights or become exhausted after constant association with the lights. However, there is no information suggesting that populations are currently unstable or decreasing as a result of these mortality sources.

The Service concludes that potential oil spills from existing or proposed platforms pose a threat to small numbers of ashy storm-petrels off southern California, and that spills from oil tankers moving off the coast of California may pose a threat to foraging and flocking ashy storm-petrels. The scale of threat would depend on the size, location, and timing within year of the spill. The Service concludes that it is unlikely that such oil spills will be of a size that would pose a significant threat to ashy storm-petrels.

The Service concludes that organochlorines still contaminate eggs of ashy storm-petrels but that current observed levels of contaminants are reduced, compared to levels observed in eggs collected during the 1990s, and that organochlorine contamination does not appear to be reducing hatching success of ashy storm-petrels. The Service concludes that, like other storm-petrels, ashy storm-petrels likely ingest plastic while foraging, but the degree to which plastic ingestion threatens ashy storm-petrels is not known and is not considered to be a threat. Finally, we have no reason to believe that any of these threats are likely to increase in the foreseeable future. Therefore, we consider these threats to be insignificant to ashy storm-petrels at Southeast Farallon Island, at the Channel Islands, or rangewide.

Foreseeable Future

In considering the foreseeable future as it relates to the status of the ashy storm-petrel, we take into consideration our analysis of the potential threats to the species as described above. No data are currently available regarding adult life span of the species; however, ashy storm-petrels are thought to live on the order of 20 to 25 years (Sydeman *et al*. 1998b, p.7). Oceanographic and climatic processes potentially affecting ashy storm-petrels operate on the order of single year to multi-decadal scales. For example, the marine environment off the west coast of North America is affected by oceanographic processes, such as El Niño and La Niña, which occur on annual scales, and the Pacific Decadal Oscillation, which occurs on decadal scales. Based on historical and recent trends of oceanographic phenomena, such as El Niño events, and our above analysis of how ashy storm-petrels are affected by El Niño events, we conclude the potential threat from changes in the ocean environment over the timescales at which they currently operate are not significant to the ashy storm-petrel.

Principle among the potential threats to the ashy storm-petrel is mortality from avian predators. There was likely a decline in the population of ashy storm-petrels at Southeast Farallon Island in the mid-1970s to the early 1990s (Sydeman *et al*. 1998a, p. 443). However, more recent data (Warzybok and Bradley 2007, p. 17) suggest an increasing population of ashy storm-petrels at Southeast Farallon Island. Additionally, mortality due to predation from owls seems to show a decreasing trend over recent years, and mortality due to predation from skunks is likely a sporadic event without a specific identifiable time element. Given these recent trends, we do not expect an increase in mortality of ashy storm-petrels in any one location or across their range.

Ashy storm-petrel breeding locations occur primarily on federally owned and managed lands in the United States and Mexico. A broad network of Federal, State, and International protections have been and are currently in place that protect the ashy storm-petrel. Based on historical and recent trends of land management policies on federally owned lands in the United States, we find it unlikely that substantial changes to current land management practices or regulations that would negatively affect ashy storm-petrels are likely to occur in the near term, and any changes are most likely on the order of decades in the future.

Based on the trend to restrict use of attracting lights used in the market squid fishery, we conclude this potential threat is not likely to increase over time. The threat of eggshell thinning from organochlorine exposure has steadily decreased over time and is not likely to increase in the future because their use is banned. The incidence of oil spills of sufficient size to significantly affect ashy storm-petrels is largely stochastic. There is no evidence of an increasing trend in the incidence of spills, and based on increased measures to ensure the safety of oil and gas transportation, we do not consider this potential threat to increase in the future. Plastics ingestion is currently not a significant threat to the ashy storm-petrel and, based on historic information, we do not believe this threat would increase in the future. Therefore, we consider the foreseeable future to encompass the timeframe over which the effects of potential threats as described above can be reasonably anticipated.

Finding

We assessed the best available scientific and commercial information regarding threats faced by the ashy storm-petrel. We reviewed numerous information sources including literature cited in the petition, information in our files, and information submitted to us following our 90–day petition finding (73 FR 28080; May 15, 2008) related to potential threats to the ashy storm-petrel (climate change, ocean acidification, sea level rise, predation, light attraction, contamination by chlorinated hydrocarbons, and plastic pollution) on ashy storm-petrels and the California Current marine environment.

We found evidence that the ashy storm-petrel is less affected by El Niño events than most seabirds in the California Current System. This is not to imply that ashy storm-petrels are not affected by El Niño events; fewer numbers of ashy storm-petrels may attempt to breed during El Niño events, and timing of breeding within year may be slightly delayed. However, ashy storm-petrels show low between-year variability in fledgling production, and unlike other seabirds, have bred in every year for which there are observations of nesting activities. Because ashy storm-petrels forage over a wide geographic area and have an extended egg-laying and chick-rearing period, they are likely more able to exploit prey resources that may be more scarce and patchily distributed. Ocean acidification is occurring, but current research does not demonstrate a link between ocean acidification and reduced abundance and survival of prey items on which ashy storm-petrels depend, nor does our analysis or current research indicate that reproductive success of ashy storm-petrels is affected by ocean acidification. Based on current projections of sea level rise that predict a 3-ft (0.9-m) rise by 2100, we found that the majority of nesting habitat is at least 4.9 ft (1.5 m) above current sea level. The exception is some nesting habitat in the Channel Islands at Cavern Point Cove Caves that may become submerged. However, this location represents a small percentage of the rangewide nesting population, and we do not consider this to be a significant threat. Introduced grasses are present on Southeast Farallon Island; however, we do not have specific information that quantifies the amount of suitable nesting habitat at Southeast Farallon Island, or other breeding locations, that may be unavailable to ashy storm-petrels because of introduced grasses. In addition, the petitioner claims that introduced grasses are widespread at all breeding locations. For example, grasses do not occur in sea caves or on most offshore rocks where ashy storm-petrels nest.

Therefore, we find that the ashy storm-petrel is not threatened by the present or threatened destruction, modification, or curtailment of the species' habitat or range, now or in the foreseeable future.

While collection of ashy storm-petrel adults and eggs has occurred throughout its breeding range over the past 124 years, the rate of specimen collection has been low and sporadic and not concentrated in any one location. The number of specimens collected to date is very small compared to the current estimated total population size. Consequently, we find that the ashy storm-petrel is not threatened by overutilization of the species for commercial, recreational, scientific, or educational purposes now or in the foreseeable future.

Predation by western gulls and owls at Southeast Farallon Island does not pose a significant threat to the ashy storm-petrel. Although populations of ashy storm-petrels at Southeast Farallon Island may have decreased from 1979 to 1992 as a result of predation, we find that the best available scientific information indicates that populations are increasing in recent years. While predation of ashy storm-petrels is likely to continue within the foreseeable future, we find that predation at Southeast Farallon Island is not a significant threat to the species. Mortality due to predation by island spotted skunks at Santa Cruz Island is not a significant threat to the ashy storm-petrel. Although sporadic island spotted skunk predation events will likely continue over time, there is no information suggesting that spotted skunk predation is a significant threat to the species. We found evidence that deer mice and house mice are likely predators or scavengers of small numbers of ashy storm-petrel eggs and small chicks, but this likely does not substantially affect the productivity of the species. Consequently, we find that the ashy storm-petrel is not threatened by disease or predation now or in the foreseeable future.

Based on our review of the best available information, we find there is a network of existing regulatory mechanisms that serve to protect the species. As much as 75 percent of ashy storm-petrel breeding locations are included in marine reserves designed to limit the use of bright lights associated with squid fishery activities, and the implementation of the Market Squid Fishery Management Plan should be effective in offering protection for ashy storm-petrels. We found no support for the petitioner's claim that a lack of regulatory mechanisms regarding the MBTA poses a threat to the ashy storm-petrel. While compliance with MBTA is not universally applied, this law provides protections from killing, taking, and possessing the ashy storm-petrel. We find that a lack of regulatory mechanisms to control GHG does not threaten the ashy storm-petrel, because we determined that processes associated with climate change, such as ocean acidification, sea level rise, and possible increases in sea surface temperatures (see Factor A) have not been shown to directly impact the ashy storm-petrel. Therefore, we find the ashy storm-petrel is not threatened by the inadequacy of existing regulatory mechanisms.

Ashy storm-petrels are attracted to bright lights. Bright lights associated with the market squid fishery may result in the reduced number of birds within specific geographic areas; however, our review of the available information does not indicate that the threat from market squid fishery lighting is contributing to mortality that results in large-scale population declines. Ashy storm-petrels that congregate in Monterey Bay in the fall months do not appear to be at particular risk from squid fishing activities because the available information indicates much of the fishing occurs during the day, whereas ashy storm-petrels feed exclusively at night. Bright lights on offshore energy platforms may contribute to small levels of ashy storm-petrel mortality; however, we found no indication that this is a significant threat to the species. Furthermore, our review of the available information does not suggest that the threat of lighting from the market squid fishery or other sources is expected to increase to any large degree in the foreseeable future. Therefore, we do not consider bright lights associated with market squid fishing or offshore energy platforms to be a significant threat to the ashy storm-petrel.

We find oil pollution does not pose a significant threat to the ashy storm-petrel. Although there is a high probability of spills from oil production platforms or tankers within the range of foraging ashy storm-petrels, this source of mortality is not expected to result in severe impacts to major portions of the population. We conclude that a relatively small proportion of the population would likely be exposed to any single oil spill, and, consequently, oil spills are not considered to be a significant threat to ashy storm-petrels. We find organochlorine contamination does not pose a significant threat to ashy storm-petrel, because this threat likely occurred in the past, is currently much reduced, and that contamination of ashy storm-petrels by organochlorines currently does not significantly reduce hatching success. Ingestion of plastic by ashy storm-petrels does not pose a significant threat to the species. We found evidence that small plastic particles occur at the ocean's surface within the feeding range of ashy storm-petrels, and we found that many species of procellariids, including storm-petrels, ingest plastics. It is likely that ashy storm-petrels ingest plastic while foraging; however, we found no direct evidence, such as dead chicks or adults, underweight chicks or adults, or observation of plastics in regurgitations that indicates that plastic ingestion is a threat to ashy storm-petrels. Therefore, we find the ashy storm-petrel is not threatened by other natural or manmade factors now or in the foreseeable future.

On the basis of our status review, we conclude the listing of the ashy storm-petrel rangewide is not warranted.

Significant Portion of the Range (SPR) Analysis

The Act defines an endangered species as one ''in danger of extinction throughout all or a significant portion of its range,'' and a threatened species as one ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' Having determined that the ashy storm-petrel does not meet the definition of a threatened or endangered species, we must now consider whether there are any significant portions of the range where the species is in danger of extinction or likely to become so in the foreseeable future.

On March 16, 2007, a formal opinion was issued by the Solicitor of the Department of the Interior, ''The Meaning of 'In Danger of Extinction Throughout All or a Significant Portion of Its Range' '' (DOI 2007). We have summarized our interpretation of that opinion and the underlying statutory language below. A portion of a species' range is significant if it is part of the current range of the species and is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability of the species to persist.

The first step in determining whether a species is endangered in an SPR is to identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that are not reasonably likely to be significant and threatened or endangered. To identify those portions that warrant further consideration, we determine whether there is substantial information indicating that (i) the portions may be significant and (ii) the species may be in danger of extinction there. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the range that are unimportant to the conservation of the species, such portions will not warrant further consideration.

We acknowledge that the Ninth Circuit Court of Appeals decision in *Defenders of Wildlife* v. *Norton*, 258 F.3d 1136 (2001) can be interpreted to require that in determining whether a species is threatened or endangered throughout a significant portion of its range, the Service should consider whether lost historical range (as opposed to current range) constitutes a significant portion of the range of the species at issue. While this is not our interpretation of the case or the statute, we conclude that there are no such areas for the ashy storm-petrel. We have no evidence to suggest that the occupied range of the ashy storm-petrel is different from its historical range, and there is no evidence to suggest a range contraction for the species. Therefore, we will not further consider lost historical range as a significant portion of the species range.

The ashy storm-petrel breeds in two main geographic areas: in the northern portion of the species range on Southeast Farallon Island, where approximately 36 to 53 percent of the entire population occurs, and in the southern portion of the species range on the California Channel Islands, where approximately 44 to 60 percent of the breeding population occurs. About 1.5 to 2 percent nests in Mexico. The two California areas are geographically separated by approximately 250 miles (402 km); however, there is no indication that the populations are genetically different, which is logical, since the ashy storm-petrel ranges widely in foraging activities. Southeast Farallon Island is located in the California Current, a cold water current; in contrast, the California Channel Islands are more affected by the Davidson Current, which is a comparatively warm water current. No other areas within the species' range contain a significant number of breeding locations. Ashy storm-petrels occur at their breeding colonies nearly year-round and occur in greater numbers from February through October (Ainley 1995, p. 5). For this reason, we consider breeding locations to be most significant to the species. The loss of all breeding ashy storm-petrels at either Southeast Farallon Island or in the Channel Islands would reduce the rangewide population of the species by approximately 50 percent, which could result in a decrease in the ability of the species to persist.

To determine whether Southeast Farallon Island or the Channel Islands may warrant further consideration as a significant portion of the range, we evaluated these two areas of the range of the ashy storm-petrel. Under our five-factor analysis for the ashy storm-petrel rangewide, we did not find any threats that were significant to the species rangewide or that were concentrated in any one particular area. The potential threat of ocean acidification, and reduced ocean primary productivity, is a rangewide threat that we concluded was not significant. This is due to the ability of the ashy storm-petrel to forage more widely than other species and because the ashy storm-petrel has not demonstrated population breeding failures as seen in other seabird species. The threat of human degradation of nesting habitats may be more evident in the Channel Islands as compared to Southeast Farallon Island, but we did not find it to be a significant threat in either area. We did find potential threats were different in the northern portion of the range compared to the southern portion of the range. Our rangewide analysis was conducted at a stepped-down geographic scale due to the natural concentration of breeding birds at Southeast Farallon Island and in the Channel Islands. On Southeast Farallon

Island, we identified a potential threat of mortality due to predation by western gulls and burrowing owls. Populations of ashy storm-petrels at Southeast Farallon Island may have decreased from 1979 to 1992 as a result of predation (Sydeman *et al.* 1998a, p. 443); however, more recent information suggests that populations are increasing in recent years (Warzybok and Bradley 2007, p. 17). Predation of ashy storm-petrels is likely to continue within the foreseeable future; however, as described above in our five-factor analysis of the rangewide population, we find that predation at Southeast Farallon Island is not a significant threat to the species. This particular predation threat from western gulls is not found in the Channel Islands; however, although predation from skunks was identified as a potential threat, we found it not to be a significant threat. Rising sea levels due to climate change may affect a small portion of the breeding population in the Channel Islands, but the large majority of nesting sites are above projected sea level rise into 2100. The use of bright, attracting lights in the market squid fishery was identified as a potential threat to breeding birds in the Channel Islands, but not to breeding birds on Southeast Farallon Island due to regulatory restrictions around the island. Our analysis of the potential threat of squid boat lights to ashy storm-petrels in the Channel Islands concluded that some low level of mortality may occur, but our review of the available information did not indicate that any such mortality would lead to a large-scale population decline and we found that adequate regulatory protections are in place. The threat of an oil spill is greater in the Channel Islands due to a greater concentration of oil producing facilities; however, predicting the possible effects of an oil spill from an offshore energy production platform is difficult and would depend on the timing and amount of a spill, prevailing ocean currents and conditions, and locations of ashy storm-petrels at the time of a spill. Similarly, the threats of plastic ingestion and organochlorine contaminants may occur in both the northern and southern portions of the ashy storm-petrel's range, but these threats are not considered to be significant anywhere within the species' range.

Therefore, based on the analysis above, we conclude that neither the ashy storm-petrels on the Southeast Farallon Island or the Channel Islands are in danger of extinction (the second step in determining whether an area is a significant portion of the range), because there is not substantial information to suggest that the ashy storm-petrel in either portion may become an endangered species within the foreseeable future.

We request that you submit any new information concerning the status of, or threats to, the ashy storm-petrel to the address listed in the **ADDRESSES** section of this notice whenever it becomes available. New information will help us monitor this species and encourage its conservation. If an emergency situation develops for this species or any other species, we will act to provide immediate protection.

References Cited

A complete list of all references cited herein is available, upon request, from the Arcata Fish and Wildlife Office (see **ADDRESSES**).

Author

The primary authors of this notice are the staff of the Arcata Fish and Wildlife Office (see **ADDRESSES**).

Authority

The authority for this action is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: August 11, 2009.

Rowan W. Gould,

Acting Director, U.S. Fish and Wildlife Service.

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