FEDERAL REGISTER

Vol. 77 Wednesday,
No. 95 May 16, 2012

Part V

Department of the Interior

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To Downlist Three San Clemente Island Plant Species; Proposed Rule To Reclassify Two San Clemente Island Plant Species; Taxonomic Correction; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2012–0007; FXES11130900000C5–123–FF09E32000]

RIN 1018–AY04

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To Downlist Three San Clemente Island Plant Species; Proposed Rule To Reclassify Two San Clemente Island Plant Species; Taxonomic Correction

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition finding and proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service, announce our 12-month findings on a petition to reclassify San Clemente Island lotus, and San Clemente Island paintbrush under the Endangered Species Act are warranted and we propose to change the status of these two species from endangered to threatened. We also propose to correct the scientific and common names of San Clement Island lotus. We are also announcing our 12-month finding on a petition to reclassify San Clemente Island bush mallow is not warranted at this time, and therefore we are not proposing to change the status of this species. We are taking these actions as a result of a petition to reclassify these three species.

DATES: The finding announced in this document was made on May 16, 2012 Regarding the proposed rule to reclassify *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea,* we will accept comments received or postmarked on or before July 16, 2012. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by July 2, 2012.

ADDRESSES: This finding is available on the Internet at *http://www.regulations.gov* at Docket Number [FWS–R8–ES–2012–0007]. 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, Carlsbad Fish and Wildlife Office, 6010 Hidden Valley Road, Suite 101, Carlsbad, CA, 92011. Please submit any new information, materials, comments, or questions concerning this finding to the above address. Regarding the proposed rule to reclassify *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea,* you may submit comments by one of the following methods:

Federal eRulemaking Portal: *http://www.regulations.gov.* Follow the instructions for submitting comments for Docket No. [FWS–R8–ES–2012–0007].

U.S. mail or hand delivery: Public Comments Processing, Attn: Docket No. [FWS–R8–ES–2012–0007]; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will not accept email or faxes. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the Public Comments Solicited section below for more information).

FOR FURTHER INFORMATION CONTACT: Jim Bartel, Field Supervisor, Carlsbad Fish and Wildlife Office (see **ADDRESSES**); by telephone at 760–431–9440; or by facsimile (fax) at 760–431–9624. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

This document contains: (1) 12-month findings in response to a petition to reclassify *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* as threatened; and (2) a proposed rule to reclassify *A. d.* var. *traskiae* and *C. grisea* as threatened under the Act.

Species addressed. Malacothamnus clementinus (San Clemente Island bush mallow), *Acmispon* (previously listed as *Lotus*) *dendroideus* var. *traskiae* (previously San Clemente Island broom and currently known as San Clemente Island lotus), and *Castilleja grisea* (San Clemente Island paintbrush) are endemic to San Clemente Island, which is located 64 miles (mi) (103 kilometers (km)) west of San Diego, California. Current habitat conditions for *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* on San Clemente Island are the result of present and historical land use practices. San Clemente Island is owned by the U.S. Department of the Navy and, with its associated offshore range complex, is the primary maritime training area for the Navy Pacific Fleet and Navy Sea, Air and Land teams (SEALs). The island also supports training by the U.S. Marine Corps, the U.S. Air Force, and other military organizations.

Purpose of the Regulatory Action. Under the Endangered Species Act, we may be petitioned to list, delist or reclassify a species. In 2010, we received a petition from the Pacific Legal Foundation requesting that the Service reclassify *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* from endangered to threatened. These species are currently listed as endangered under the Act. In 2011, we published our 90-day finding on the petition which concluded that the petition contained substantial information indicating reclassification of the three San Clemente Island plants may be warranted. We therefore also announced that we were initiating status reviews for these taxa as required under the Act. A change in listing status can only be done by issuing a rule.

Basis for the Regulatory Action. Under the Endangered Species Act, a species may be determined to be endangered or threatened based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

We reviewed all available scientific and commercial information pertaining to the five threat factors in our status review of each species.

We summarize the results of our status review for each species below.

Malacothamnus clementinus (San Clemente Island Bush Mallow)

• Our review does not support a conclusion that the threats have been sufficiently removed, or that their imminence, intensity, or magnitude have been reduced to the extent that the species no longer meets the definition of an endangered species. Threats associated with military activities, erosion, nonnatives, fire, climate change, and low genetic diversity continue to impact *Malacothamnus clementinus* at all of the 11 occurrences on San Clemente Island. *M. clementinus* continues to be impacted throughout its range because of the change in intensity of training and associated impacts enacted in the 2008 San Clemente Island Military Operations and Fire Management Plan (MOFMP). Additionally, closure of areas on San Clemente Island to natural resource personnel creates uncertainty regarding the status of 4 of 11 occurrences, including the largest and most genetically diverse, and whether those

occurrences will benefit from conservation measures.

- We find that reclassifying *Malacothamnus clementinus* is not warranted at this time.
- Although we recommended downlisting in our 2007 status review, at this time we believe that *Malacothamnus clementinus* continues to be in danger of extinction throughout its range.

Acmispon dendroideus var. traskiae (San Clemente Island Lotus)

- We find that the ongoing threats are not of sufficient imminence, intensity, or magnitude to indicate that *Acmispon dendroideus* var. *traskiae* is presently in danger of extinction throughout its range and does not, therefore, meet the definition of an endangered species.
- Since listing and the removal of feral goats and pigs on San Clemente Island, the distribution of *Acmispon dendroideus* var. *traskiae* has expanded from 6 to 29 occurrences. Significant gains in distribution demonstrate that the species is persisting despite existing threats across the landscape.
- The Navy is implementing an Island Integrated Natural Resources Management Plan (INRMP) to coordinate the management of natural resources and provide for long-term conservation planning within the scope of military readiness.
- While it is anticipated that military training activities, erosion, nonnatives, and fire will have ongoing impacts to *A. d.* var. *traskiae* habitat, impacts from these threats are reduced and minimized based on its distribution and current and anticipated conservation efforts for the taxon.
- We find that reclassifying *Acmispon dendroideus* var. *traskiae* as threatened is warranted.

Castilleja grisea (San Clemente Island Paintbrush)

- We find the ongoing threats are not of sufficient imminence, intensity, or magnitude to indicate that *Castilleja grisea* is presently in danger of extinction across its range and does not, therefore, meet the definition of an endangered species.
- Since listing and the removal of feral goats and pigs on San Clemente Island, the distribution of *Castilleja grisea* has expanded from 19 to 29 known occurrences. This significant increase in occurrences shows that the species is persisting despite existing threats across the landscape.
- The Navy is implementing an Island Integrated Natural Resources Management Plan (INRMP) to coordinate the management of natural resources and provide for long-term conservation planning within the scope of military readiness.
- While it is anticipated that military training activities, erosion, nonnatives, and fire will have ongoing impacts to *Castilleja grisea* habitat, impacts from these threats are reduced and minimized based on its distribution and current and anticipated conservation efforts for the taxon.
- We find that reclassifying *Castilleja grisea* as threatened is warranted.

We are proposing the following changes to the List of Threatened and Endangered Plants:

- Correct the scientific and common names of *Acmispon dendroideus* var. *traskiae,* formerly known as *Lotus dendroideus* var. *traskiae* (San Clemente broom).
- Change the status of *Acmispon dendroideus* var. *traskiae* from endangered to threatened.
- Change the status of *Castilleja grisea* from endangered to threatened.

Acronyms Used

We use several acronyms throughout the preamble to this proposed rule. To assist the reader, we set them forth here:

AFP = Artillery Firing Point
AVMA = Assault Vehicle Maneuver Area
BMP = Best Management Practices
CERCLA = Comprehensive Environmental Response, Compensation and Liability Act
CESA = California Endangered Species Act
CDFG = California Department of Fish and Game
CNDDB = California Natural Diversity Database
CNPS = California Native Plant Society
DPS = Distinct Population Segment
EO = California Natural Diversity Database element occurrence
GIS = Geographic Information System
INRMP = Integrated Natural Resources Management Plan
IOA = Infantry Operations Areas
IPCC = Intergovernmental Panel on Climate Change
MOFMP = Military Operations and Fire Management Plan
Navy = United States Department of the Navy
NEPA = National Environmental Policy Act
NPPA = Native Plant Protection Act
OHV = Off Highway Vehicle
OMB = Office of Management and Budget
PL = Point Location
RCRA = Resource Conservation and Recovery Act
SEALs = Navy Sea, Air, and Land teams
SERG = San Diego State University Soil Ecology and Restoration Group
SHOBA = Shore Bombardment Area
SPR = Significant Portion of the Range
SWAT = Special Warfare Training Areas
TAR = Training Area Ranges
USFWS = United States Fish and Wildlife Service

Public Comments Solicited

Our intent is to use the best available commercial and scientific data as the foundation for all endangered and threatened species classification decisions. Therefore, we request comments or information from the public, other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed rule to downlist *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea.* We particularly seek comments concerning:

(1) Reasons why we should or should not reclassify *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* under the Act.

(2) New biological, trade, or other relevant information and data concerning any threat (or lack thereof) to *A. d.* var. *traskiae* and *C. grisea.*

(3) New information and data on the projected and reasonably likely impacts to *A. d.* var. *traskiae* and *C. grisea* associated with climate change.

(4) The location of, and status, trends, and threats to, any additional occurrences of *A. d.* var. *traskiae* and *C. grisea.*

(5) New information and data concerning the range, distribution, occurrence size, and occurrence trends of *A. d.* var. *traskiae* and *C. grisea.*

(6) New information and data on the current or planned activities within the geographic range of *A. d.* var. *traskiae* and *C. grisea* that may adversely affect or benefit the species.

(7) New information on the host plants of *C. grisea.*

(8) Information and data on the hybridization of *A. d.* var. *traskiae,* and the impacts of this hybridization on the species.

We will also continue to accept new information that becomes available concerning the status or threats to the *Malacothamnus clementinus* or its habitat at any time.

We will post your entire comment on *http://www.regulations.gov.* Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule,

will be available for public inspection on *http://www.regulations.gov,* or by appointment during normal business hours at the Carlsbad Fish and Wildlife Office (see **ADDRESSES**).

Public Hearing

The Act provides for one or more public hearings on this proposal, if requested. Requests must be received by the date specified in **DATES**. Such requests must be made in writing and addressed to the Field Supervisor (see **FOR FURTHER INFORMATION CONTACT** section above).

Background

Section 4(b)(3)(B) of the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*), requires that, for any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific or commercial information that reclassifying the species may be warranted, we make a finding within 12 months of the date of receipt of the petition. In this finding, we will determine 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 species are endangered or threatened, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and Threatened Wildlife and Plants. We must publish these 12-month findings in the **Federal Register**.

Previous Federal Actions

Malacothamnus clementinus, Acmispon dendroideus var. *traskiae,* and *Castilleja grisea* were listed as endangered under the Act on August 11, 1977 (42 FR 40682). Subsequently, a Recovery Plan for Channel Island species, including *M. clementinus, A. d.* var. *traskiae,* and *C. grisea,* was finalized in 1984 (USFWS 1984, pp. 1–165), and 5-year status reviews were completed for each of these taxa in 2007 (USFWS 2007a, pp. 1–28; USFWS 2007b, pp. 1–22; USFWS 2007c, pp. 1–19). These status reviews recommended reclassification of *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* from endangered to threatened status.

On May 18, 2010, we received a petition dated May 13, 2010, from the Pacific Legal Foundation requesting that the Service delist *Oenothera californica (avita)* subsp. *eurekensis* (Eureka Valley evening-primrose) and *Swallenia alexandrae* (Eureka Valley dunegrass), and downlist tidewater goby (*Eucyclogobius newberryi*), *Acmispon dendroideus (Lotus scoparius* subsp.) var. *traskiae, Malacothamnus clementinus,* and *Castilleja grisea* from endangered to threatened under the Act. The petition was based on the analysis and recommendations contained in the 2007 5-year reviews for these taxa. In a letter to the petitioner dated September 10, 2010, we acknowledged receipt of the petition and initiated a review of the petition under a provision of section 4 of the Act. We stated that we anticipated making an initial 90-day finding in Fiscal Year 2011 (based on available staffing and funding) as to whether or not the petition presented substantial information indicating that the requested action may be warranted.

On January 19, 2011, we published a 90-day finding (76 FR 3069) in which we concluded that the petition and information in our files provided substantial information that the reclassification of these species may be warranted, and announced that we were initiating status reviews for these species. Five-year reviews pursuant to section 4(c)(2)(A) of the Act for *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* were previously initiated on May 21, 2010 (75 FR 28636). We will base our 5-year review recommendations on the information and conclusions provided in this finding, and we expect to finalize those reviews following publication of this finding. To ensure that the status reviews are comprehensive, we requested in the 90-day finding any scientific or commercial data and other information regarding these taxa be submitted by March 21, 2011. This document includes: (1) A notice that constitutes the 12-month finding in response to the petition to reclassify *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* as threatened (the 12-month findings for *O. californica (avita)* subsp. *eurekensis, S. alexandrae,* and tidewater goby will be addressed in separate documents); and (2) a proposed rule to reclassify *A. d.* var. *traskiae* and *C. grisea* from endangered to threatened under the Act.

Species Information

For purposes of this finding, we present the species description and taxonomy for each individual plant species below. However, the remaining species information, where possible, is combined for all three taxa to avoid redundancy, followed by applicable species-specific information by taxon.

Species Description and Taxonomy—*Malacothamnus clementinus*

Malacothamnus clementinus is a rounded subshrub (stems woody only at the base) in the Malvaceae (mallow family). Plants are 2.3 to 3.3 feet (ft) (0.7 to 1 meters (m)) tall with numerous hairy branched stems arising from the base of the plant (Munz and Johnston 1924, p. 296; Munz 1959, pp. 122–125; Bates 1993, p. 752; Junak 2006a, pers. comm.). Plants have the ability to spread vegetatively by underground rhizomes, resulting in patches of spatially separate, but genetically identical, individuals (Evans and Bohn 1987, p. 538). The leaves are 1.2 to 2 inches (in) (3 to 5 centimeters (cm)) wide and conspicuously bicolored, with green upper surfaces covered in short fine hairs and veiny, white undersurfaces that are densely matted with hairs (Munz and Johnston 1924, p. 296). Flowers are clustered in the uppermost leaf axils, forming interrupted spikes 3.9 to 7.9 in (10 to 20 cm) long (Munz 1959, p. 125). Flowers are bisexual and variously described as having pink or white and fading lavender petals (Munz and Johnston 1924, p. 296; Bates 1993, p. 752). Each flower can produce about 10 seeds that are 0.08 in (2 millimeters (mm)) long (Munz 1959, p. 122; Navy 2002, p. C–43). The fruits mature and open slowly and irregularly on the plant (Navy 2002, p. C–43). The genus *Malacothamnus* includes 20 species found in the southwestern region of the United States (Junak and Wilken 1998, p. 290). *Malacothamnus clementinus* is endemic to San Clemente Island and is the only species within the genus that occurs there (Bates 1993, p. 752; Tierra Data Inc. 2005, p. C–8).

No taxonomic classifications or nomenclature changes affecting this taxon have been published since it was listed as endangered in 1977. The *Jepson Manual,* the standard reference flora for the State, continued to treat this species under the same name, *Malacothamnus clementinus,* in the recent edition (Bates 2012, pp. 1–2).

Species Description and Taxonomy—*Acmispon dendroideus* var. *traskiae*

Acmispon dendroideus var. *traskiae* is a suffrutescent (semi-woody), short-lived (less than 5 years), floriferous (flower bearing) subshrub in the legume family Fabacaeae (pea family). It is endemic to San Clemente Island (Isely 1993, p. 619), and is one of five taxa in the genus *Acmispon* found on the island (Tierra Data Inc. 2005, p. C–8; Brouillet 2008, pp. 388–392). There are no other varieties of *A. dendroideus* found on the island. This variety can be distinguished from other varieties of *A. dendroideus* by its bushy habit and elongated fruits (Allan 1999, p. 88). *Acmispon dendroideus* var. *traskiae* is typically

less than 4 ft (1.2 m) tall with slender erect green branches (Munz 1974, pp. 449–450; USFWS 1984, p. 59; Allan 1999, p. 82). Each leaf has three to five leaflets, each approximately 0.2 to 0.3 in (5 to 9 mm) long and uniformly glabrous (surface without hair) to finely hairy (USFWS 1984, p. 59; Allan 1999, p. 82). *Acmispon dendroideus* var. *traskiae* has small yellow flowers that are bisexual and arranged in one to five flowered clusters on stalks that arise from axils between the stem and leaf of terminal shoots (Junak and Wilken 1998, p. 256). Pistils are initially yellow, turning orange then red as the fruit matures (USFWS 1984, p. 59; California Native Plant Society (CNPS) 2001, p. 208).

Acmispon dendroideus var. *traskiae* has undergone taxonomic realignments since the 1977 listing. We accept the change of scientific name to *Acmispon dendroideus* (Greene) Brouillet var. *traskiae* (Noddin) Brouillet from *Lotus dendroideus* (Nutt.) Ottley subsp. *traskiae.* This change is supported by morphological and molecular data (Allan and Porter 2000, p. 1876; Sokoloff 2000, p. 128; Brouillet 2008, p. 389).

The name used for this taxon when it was listed in 1977 (42 FR 40682) was *Lotus scoparius* (Nutt.) Ottley subsp. *traskiae* (Abrams) Raven. Subsequently, Isely (1978, p. 467) separated this and two other Channel Islands endemic taxa (*L. scoparius* var. *veatchi* Ottley and *L. scoparius* var. *dendroideus* (Greene) Ottley) from mainland *Lotus scoparius.* He recognized them as varieties (considered equivalent to subspecies in plants) of a single species, *Lotus dendroideus,* which was the oldest name among the three taxa. The name, *Lotus dendroideus* var. *traskiae,* was published by Isely in 1978 (p. 467), and recognized in floristic (Isely 1993, p. 619) and systematic treatments (Isely 1998, p. 646). Following Isely's taxonomic revision, we amended the list of endangered and threatened plants (50 CFR 17.12), but incorrectly transcribed the name as *Lotus dendroideus* subsp. *traskiae* (USFWS 1980, 45 FR 82483). This combination, as a subspecies and not a variety, was never validly published and thus cannot be used.

Recent morphological (Sokoloff 2000, p. 128) and molecular (Allan and Porter 2000, p. 1876) data support recognition of a separate genus, *Acmispon,* from *Lotus.* The required nomenclatural combination *Acmispon dendroideus* (Greene) Brouillet var. *traskiae* (Noddin) Brouillet was made in 2008 (Brouillet 2008, p. 389). This name is recognized and accepted by the scientific community in floristic works, the *Jepson Manual* revision for California (Brouillet 2012), and the continental *Flora of North America,* as well as by the California Native Plant Society (CNPS 2011). We concur with the scientific evidence and acceptance by the scientific community and likewise accept the name *Acmispon dendroideus* var. *traskiae.* Based upon this acceptance, we will make appropriate corrections to this taxon's references in our regulations (50 C.F.R. 17.12) and will use this nomenclature in future notices regarding this taxon. Moreover, in previous documents, this taxon has been referred to by other common names (such as Trask's Island lotus, San Clemente Island broom, and San Clemente Island lotus) (Isely 1993, p. 619; 76 FR 3069, January 19, 2011; 42 FR 40682, August 11, 1977). In this document, we use San Clemente Island lotus to represent *A. d.* var. *traskiae.* The taxonomic and nomenclatural changes described here do not alter the description, distribution, or listing status of the taxon.

Species Description and Taxonomy—*Castilleja grisea*

Castilleja grisea is a highly branched hemiparasitic (plant that can be either free-living or parasitic) perennial herb to subshrub in the Orobanchaceae (broomrape family) (Chuang and Heckard 1993, p. 1016; Young *et al.* 1999, p. 890; Olmstead *et al.* 2001, p. 352). *Castilleja grisea* is endemic to San Clemente Island and the only species of the genus found there (Chuang and Heckard 1993, p. 1021; Helenurm *et al.* 2005, p. 1222; Tierra Data Inc. 2005, p. A–7). *Castilleja grisea* plants are 1.3 to 2 ft (0.4 to 0.6 m) tall and ash-gray in color with densely hairy leaves (Chuang and Heckard 1993, p. 1021). The leaves are alternate and linear, and 0.4 to 2 in (1 to 5 cm) long with 0 to 3 lobes (Chuang and Heckard 1993, p. 1021). The yellow bisexual flowers are borne in terminal spikes. The fruit is a semi-woody capsule, 0.4 to 0.5 in (10 to 12 mm) long, bearing many small seeds (Chuang and Heckard 1993, p. 1021; Junak and Wilken 1998, p. 83). Seeds have a deeply netted seedcoat, and are 0.4 to 0.6 in (1 to 1.5 mm) in diameter (Muller and Junak 2011, p. 12).

Castilleja grisea was described by Dunkle (p. 31) in 1943. The name has not changed since the species was listed, although the family affiliation has been changed to the Orobanchaceae (broomrape family) from the Scrophulariaceae (figwort family; Olmstead *et al.* 2001, p. 352). We will revise our regulations at 50 C.F.R. 17.12 to reflect this change in family affiliation. This taxonomic change remains consistent in the upcoming edition of the *Jepson Manual* (Chuang and Heckard, Weatherwax, rev. 2012).

Species Location

Description and Land Use of San Clemente Island

Malacothamnus clementinus, Acmispon dendroideus var. *traskiae,* and *Castilleja grisea* are endemic to San Clemente Island (Raven 1965, p. 60), which is located 64 miles (mi) (103 kilometers (km)) west of San Diego, California (USFWS 1984, p. 5). The island is approximately 56 square mi (145 square km) (Junak and Wilken 1998, p. 2) and is long and narrow: 21 mi (34 km) long by 1.5 mi (2.4 km) wide at the north end and 4 mi (6.4 km) wide at the south end (USFWS 1984, p. 5).

The historical ranges and distributions of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* on San Clemente Island are unknown because botanical studies were not conducted on the island prior to grazing, which began in the 1800s (Kellogg and Kellogg 1994, p. 4). The first herbarium specimens were collected in 1894 for *M. clementinus* and *C. grisea,* and in 1905 for *A. d.* var. *traskiae.* Although herbarium specimens were collected from time to time, the first surveys for these species did not occur until the 1970s (USFWS 2007b, p. 4).

San Clemente Island is owned by the U.S. Department of the Navy (Navy) and, with its associated offshore range complex, is the primary maritime training area for the Pacific Fleet and SEALs. The island also supports training by the U.S. Marine Corps, the U.S. Air Force, and other military organizations. As the western most training range in the eastern Pacific Basin where training operations are performed prior to troop deployments, portions of the island receive intensive use by the military (Navy 2008b, p. 2–2). Various training activities occur within particular land use designations and training areas on the island, which are coincidentally concentrated in habitat that supports *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea.* In 2008, the Navy adopted the MOFMP to increase the amount and intensity of training on San Clemente Island (Navy 2008b, pp. 2–1 to 2–52). The impact to habitat from military activities is increasing under this plan (USFWS 2008, pp. 1–237).

Military training activities within Naval Special Warfare Training Areas (SWAT), Training Area Ranges (TAR), Impact Areas, and the Infantry

Operations Areas (IOA) involve the movement of vehicles and troops over the landscape, and can include live munitions fire, incendiaries, demolitions, and bombardment. These activities have multiple impacts, including disturbances to soil and vegetation, spread of nonnative plant species, creation of road ruts and trails, and compaction of soils (USFWS 2008, pp. 83–87). TARs cover a total of 1,840 acres (ac) (744 hectares (ha)), or 5.4 percent of the island, while IOAs encompass 8,815 ac (3,567 ha) or approximately 25 percent of the island, SWATs cover a total of 10,897 ac (4410 ha) or approximately 30 percent of the island, and Impact Areas cover 3,459 ac (1,400 ha) or approximately 10 percent of the island (Navy 2008a, pp. 2–17, 2–45; Navy 2008b, p. 3.11–52).

The Navy has delineated areas of military use to define where specific activities will take place. These delineated areas include the Shore Bombardment Area (SHOBA), constituting the southern one third of the island. Please note that while the SHOBA boundary is illustrated in Figures 1 to 3, no other boundaries are shown for security reasons, although other training areas will be discussed in the text of this document. SHOBA, which covers approximately 10,061 ac (4071 ha) (Navy 2009, p. 2–4), serves as a buffer around Impact Areas I and II and supports a variety of training operations. Parts of SHOBA are not subject to training activities and serve only as a buffer, while other areas support military activities, including movement of troops and vehicles or bombing exercises (Navy 2002, p. 2–4). The Impact Areas sustain heavy live fire and are a recurrent source of wildfires. Fuel breaks are applied each year prior to fire season to help prevent spread of fire to areas outside of the Impact Areas.

Because parts of SHOBA are used for ship-to-shore bombardment, access to this area is restricted for nonmilitary personnel on days when bombing is occurring. Individuals conducting surveys or working on invasive species control projects are granted access to areas outside of the Impact Areas within SHOBA when military activities requiring exclusive use are not occurring. Because of the frequency of training, access to SHOBA can be restricted for long periods of time. Range operators are aware of the natural resource obligations within SHOBA, and at least 1 day a week is usually allowed for natural resource programs to conduct their activities. Weeks with reduced natural resource access, including infrequent events that exclude natural resource personnel from SHOBA for 10 to 20 days, are announced in advance and provide natural resource managers the opportunity to plan accordingly.

Safety concerns relative to the presence of unexploded ordnance within SHOBA have recently prompted the Navy to review access policies (O'Connor 2006, pers. comm.; USFWS 2008, p. 50; Munson 2011c, pers. comm.). In the Navy's MOFMP (Navy 2008a; pp. 2–38 to 2–44), Impact Areas I and II were indefinitely closed ''for any purpose, including monitoring and management of endangered and sensitive species and their habitat'' for safety reasons (Navy 2008a, p. 2–45). Impact Areas I and II cover approximately 3,459 ac (1,400 ha), or approximately 10 percent of the island's 36,000 ac (14,568 ha; Navy 2008a, p. 2–45. The Navy is revising its INRMP to develop solutions to monitor species and their threats in these areas potentially through unmanned vehicles, aircraft, or with the assistance of range maintenance personnel that regularly access the areas. In the meantime, there are no monitoring or management actions occurring in these areas.

Access to additional areas on the island where unexploded ordnance has been found is now also restricted for natural resource personnel (such as areas in the eastern escarpment within SHOBA, Eel Point, Pyramid Head, and Lemon Tank Canyon) (Munson 2011c, pers. comm.). Restricted access to these sites limits the opportunities to acquire information on the status of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* occurrences, and inhibits the ability to manage threats in those areas. The Navy is developing plans to trim the vegetation in these areas so that sweeps by specially trained technicians can clear the areas of unexploded ordnance to allow access by nonmilitary personnel (Munson 2011c, pers. comm.).

As part of its monitoring and recovery efforts for listed species, the Navy initiated several rare plant surveys on San Clemente Island (Junak and Wilken 1998, pp. 1–416, GIS data; Junak 2006, pp. 1–176, GIS data; Tierra Data Inc. 2008, pp. 1–24, appendices and GIS data; SERG 2009–2011, GIS data). These surveys involved the collection of point locations that represent discrete localities of plants detected during field surveys. Temporal and spatial variation among data points from these surveys is likely due to differences between individual researchers' survey techniques or accuracy of data records. Groups of plants were described in the past using many different terms including: Point localities, populations, occurrences, and element occurrences. Unless referring to a specific author's research and language, we refer to identifiable and separable groups of plants as ''occurrences'' in this finding and proposed rule. We defined these occurrences by mapping smaller groupings of plants (point locations) and combining point locations that fall within 0.25 mi (402 m) of one another with any corresponding California Natural Diversity Database (CNDDB) polygons. These combined points meet the broader California Department of Fish and Game (CDFG) definition of an element occurrence, which is a record of an observation or series of observations. Discussion of occurrences throughout this 12-month finding includes groupings of CNDDB element occurrences and point localities within a 0.25-mi (402 m) radius of a given occurrence. Information for each occurrence of these three taxa is described in Table 1.

TABLE 1—DISTRIBUTION AND STATUS OF OCCURRENCES OF *Malacothamnus clementinus* (SAN CLEMENTE ISLAND BUSH MALLOW), *Acmispon dendroideus* VAR. *traskiae* (SAN CLEMENTE ISLAND LOTUS), AND *Castilleja grisea* (SAN CLEMENTE ISLAND PAINTBRUSH)

Location description	Element occurrence (EO) # and point location (PL) [1]	Status [2] at listing; year of first record	Current status (reference)	Current threats [3]	Military use [4]
Malacothamnus clementinus					
Canchalagua Canyon	No EO; 1 PL	Unknown	Presumed Extant (SERG 2011).	A: Nonnative, Fire; E: Fire, Climate, Genetic.	Low Military Value; Area Recently Closed.
Horse Beach Canyon	EO 3; 48 PLs	Unknown	Presumed Extant (Junak 2005).	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Fire, Climate, Genetic.	High Military Value; Area Closed.
Lower China Canyon	EO 1; 9 PLs	Extant; 1975 herbarium record.	Presumed Extant (Junak 1997, SERG 2009).	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Fire, Climate, Genetic.	High Military Value; Area Closed.
Upper China Canyon (including Upper Horse Beach Canyon).	No EO; 4 PLs	Extant; 1975 herbarium record.	Extant (SERG 2010)	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Fire, Climate, Genetic.	Low Military Value.
Cave Canyon (including Kinkipar Canyon).	No EO; 27 PLs	Unknown	Extant (SERG 2010)	A: Nonnative, Fire; E: Fire, Climate, Genetic.	Medium Military Value.
Chukit Canyon	2 PLs	Unknown	Extant (Junak 2004)	A: Nonnative, Fire; E: Fire, Climate, Genetic.	Low Military Value.
Lemon Tank Canyon	EO 2	Extant; 1923 herbarium record.	Presumed Extant (CNDDB 1996).	A: Land Use, Erosion, Nonnative; E: Movement, Climate, Genetic.	Low Military Value; Area Closed.
Box Canyon	EO 4; 9 PLs	Unknown	Extant (SERG 2009)	A: Nonnative; E: Climate, Genetic.	Low Military Value.
Norton Canyon	EO 7; 27 PLs	Unknown	Extant—(SERG 2011)	A: Nonnative; E: Climate, Genetic.	Low Military Value.
Middle Ranch Canyon	EO 5; 5 PLs	Unknown	Extant (SERG 2008)	A: Erosion, Nonnative; E: Climate, Genetic.	Low Military Value.
Waymuck Canyon	EO 6; 1 PL	Unknown	Presumed Extant (CNDDB 1985).	A: Erosion, Nonnative; E: Climate, Genetic.	High Military Value.
Acmispon dendroideus var. ***traskiae***					
Eagle Canyon	EO 1, 9 PLs	Extant; 1980 CNDDB	Extant (Junak 2006, SERG 2008).	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value; Area Recently Closed.
Bryce Canyon	No EO, 14 PLs	Unknown	Extant (SERG 2009)	A: Nonnative, Fire; : Fire, Climate.	Low Military Value; Area Recently Closed.
North Mosquito Cove	EO 8, 14 PLs	Extant; 1939 herbarium record.	Extant (SERG 2010)	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value; Area Recently Closed.
Canchalagua Canyon (including south Mosquito Cove).	EO 4, 21 PLs	Unknown	Extant (SERG 2011)	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value; Area Recently Closed.
Thirst Canyon (including Vista Canyon).	No EO, 8 PLs	Unknown	Extant (SERG 2009)	A: Nonnative, Fire; E: Fire, Climate.	Medium Military Value.
Cave Canyon	No EO, 3 PLs	Unknown	Presumed Extant (Junak 1997).	A: Nonnative, Fire; E: Fire, Climate.	Medium Military Value.
Horse Canyon	No EO, 2 PLs	Unknown	Presumed Extant (Junak 1997).	A: Nonnative, Fire; E: Fire, Climate.	Medium Military Value.
Pyramid Head	EO 5, 1 PL	Extant; 1979 CNDDB	Presumed Extant (Junak 1997).	A: Nonnative, Fire; E: Fire, Climate.	High Military Value; Area Closed.

TABLE 1—DISTRIBUTION AND STATUS OF OCCURRENCES OF *Malacothamnus clementinus* (SAN CLEMENTE ISLAND BUSH MALLOW), *Acmispon dendroideus* VAR. *traskiae* (SAN CLEMENTE ISLAND LOTUS), AND *Castilleja grisea* (SAN CLEMENTE ISLAND PAINTBRUSH)—Continued

Location description	Element occurrence (EO) # and point location (PL) [1]	Status [2] at listing; year of first record	Current status (reference)	Current threats [3]	Military use [4]
SHOBA Boundary (north to Twin Dams Canyon).	No EO, 8 PLs	Unknown	Presumed Extant (Junak 1996).	A: Nonnative; E: Climate.	Medium Military Value.
Twin Dams Canyon	No EO, 2 PLs	Unknown	Extant (Junak 2006)	A: Nonnative; E: Climate.	Medium Military Value.
Horton Canyon (including Stone, Burn's, and Horton Canyons).	EO 13, 27 PLs	Unknown	Extant (SERG 2010)	A: Erosion, Nonnative; E: Climate.	Medium Military Value.
Tota Canyon	No EO, 7 PLs	Unknown	Presumed Extant (SERG 2010).	A: Erosion, Nonnative; E: Climate.	Low Military Value.
Lemon Tank Canyon (including Nanny Canyon).	No EO, 19 PLs	Unknown	Extant (Junak 2004)	A: Erosion, Nonnative; E: Movement, Climate.	Low Military Value; Area Partially Closed.
Larkspur Canyon	EO 16, 2 PLs	Unknown	Extant (SERG 2011)	A: Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value.
Chamish Canyon	EO 3, 1 PL	Extant; 1980 CNDDB	Presumed Extant (Junak 1997).	A: Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value.
Box Canyon	No EO, 2 PLs	Unknown	Presumed Extant (Junak 1997).	A: Nonnative; E: Climate.	Low Military Value.
Norton Canyon	No EO, 1 PL	Unknown	Extant (Junak 2004)	A: Nonnative; E: Climate, Hybridization.	Low Military Value.
Upper Middle Ranch Canyon.	EO 10, 5 PLs	Unknown	Extant (Junak 2004)	A: Erosion, Nonnative; E: Climate.	Low Military Value.
Lower Middle Ranch Canyon.	No EO, 3 PLs	Unknown	Extant (SERG 2008)	A: Nonnative; E: Climate.	Low Military Value.
Waymuck Canyon	No EO, 4 PLs	Unknown	Extant (SERG 2011)	A: Nonnative; E: Climate.	High Military Value.
Warren Canyon	EO 12, 20 PLs	Unknown	Extant (SERG 2011)	A: Erosion, Nonnative; E: Movement, Climate.	High Military Value.
Middle Wallrock Canyon.	No EO, 10 PLs	Unknown	Extant (Junak 2004)	A: Nonnative; E: Movement, Climate.	High Military Value.
Upper Wallrock Canyon.	No EO, 3 PLs	Unknown	Extant (Junak 2006)	A: Erosion, Nonnative; E: Climate.	High Military Value.
Seal Cove Terraces	No EO, 3 PLs	Unknown	Extant (Junak 2004)	A: Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	High Military Value.
Eel Cove Canyon (including terraces).	EO 14, 6 PLs	Unknown	Extant (SERG 2010)	A: Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	High Military Value.
Middle Island Plateau	EO 7, 6 PLs	Unknown	Extant (Tierra Data 2007).	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	High Military Value.
Wilson Cove	EO 11, 52 PLs	Extant; 1981 CNDDB	Extant (SERG 2010)	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate, Hybridization.	High Military Value.
North Wilson Cove	EO 9, no PLs	Extant; 1959 herbarium record.	Unknown	A: Erosion, Nonnative; E: Climate.	High Military Value.
North Island Terraces	EO 15, no PLs	Unknown	Presumed Extant (CNDDB 1996).	A: Erosion, Nonnative; E: Movement, Climate.	Medium Military Value.
			Castilleja grisea		
Thirst Canyon (including Vista Canyon).	EO 10, 11 & 40; 21 PLs.	Extant; 1980 CNDDB	Extant (SERG 2010)	A: Nonnative, Fire; E: Climate.	Medium Military Value.

TABLE 1—DISTRIBUTION AND STATUS OF OCCURRENCES OF *Malacothamnus clementinus* (SAN CLEMENTE ISLAND BUSH MALLOW), *Acmispon dendroideus* VAR. *traskiae* (SAN CLEMENTE ISLAND LOTUS), AND *Castilleja grisea* (SAN CLEMENTE ISLAND PAINTBRUSH)—Continued

Location description	Element occurrence (EO) # and point location (PL) [1]	Status [2] at listing; year of first record	Current status (reference)	Current threats [3]	Military use [4]
Eagle Canyon (including Grove Canyon).	EO 7 & 30; 50 PLs ...	Extant; 1979 herbarium record.	Extant (Tierra Data 2006).	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Climate.	Low Military Value; Area Recently Closed.
Bryce Canyon	EO 3, 8 & 47; 43 PLs	Extant; 1979 GIS data.	Extant (SERG 2010)	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Climate.	Low Military Value; Area Recently Closed.
Canchalagua Canyon (including south Mosquito Cove and Matriarch Canyon).	EO 4 & 27; 56 PLs ...	Extant; 1963 herbarium record.	Extant (SERG 2011)	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Climate.	Low Military Value; Area Recently Closed.
Knob Canyon	EO 2 & 49; 21 PLs ...	Extant; 1979 CNDDB	Extant (Tierra Data 2006, SERG 2008).	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Climate.	Low Military Value; Area Recently Closed.
Pyramid Head	EO 1 & 15; 25 PLs ...	Extant; 1965 herbarium record.	Extant (SERG 2011)	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Climate.	High Military Value; Partially Recently Closed.
Snake Canyon (including Sun Point).	EO 23; 4 PLs	Extant; 1939 CNDDB	Presumed Extant (Junak 1997).	A: Nonnative, Fire; E: Fire, Climate.	High Military Value; Area Closed.
Upper Chenetti Canyon.	EO 34; 1 PL	Unknown	Extant (Junak 2004)	A: Nonnative, Erosion, Fire, Fire Management; E: Fire, Climate.	High Military Value; Area Closed.
Horse Beach Canyon	EO 33 & 35; 49 PLs	Extant; 1939 herbarium record.	Presumed Extant (Junak 2005).	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Fire, Climate.	High Military Value; Area Closed.
China Canyon	EO 25, 37 & 46; 6 PLs.	Extant; 1939 herbarium record.	Presumed Extant (Junak 1997; SERG 2009).	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Fire, Climate.	High Military Value; Area Closed.
Red Canyon	EO 36; no PLs	Extant; 1975 herbarium record.	Presumed Extant (CNDDB 1986).	A: Land Use, Erosion, Nonnative, Fire, Fire Management; E: Movement, Fire, Climate.	High Military Value; Area Closed.
Kinkipar Canyon	No EO; 2 PLs	Unknown	Extant (SERG 2006)	A: Nonnative, Fire; E: Climate.	Medium Military Value.
Cave Canyon	EO 17, 18 & 45; 9 PLs.	Extant; 1980 CNDDB	Extant (SERG 2009)	A: Nonnative, Fire; E: Climate.	Medium Military Value.
Horse Canyon	No EO; 6 PLs	Unknown	Extant (SERG 2010)	A: Nonnative, Fire; E: Climate.	Medium Military Value.
Upper Horse Canyon	EO 19 & 39; 1 PL	Extant; 1979 CNDDB	Extant (Junak 2004)	A: Erosion, Nonnative, Fire; E: Climate.	Medium Military Value.
SHOBA Boundary (north to and including Twin Dams Canyon).	EO 31; 55 PLs	Extant; 1965 CNDDB	Extant (Junak 2006, SERG 2011).	A: Nonnative; E: Climate.	Medium Military Value.
Horton Canyon (including Stone and Burn's Canyons).	EO 12 & 44; 24 PLs	Extant; 1981 CNDDB	Extant (Junak 2006, SERG 2010).	A: Erosion, Nonnative; E: Climate.	Medium Military Value.
Lemon Tank Canyon (including Tota Canyon).	No EO; 14 PLs	Unknown	Extant (SERG 2010)	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value; Area Closed.
Nanny Canyon	EO 13; 3 PLs	Extant; 1979 CNDDB	Extant (Junak 2004)	A: Nonnative; E: Movement, Climate.	Low Military Value; Area Partially Closed.

TABLE 1—DISTRIBUTION AND STATUS OF OCCURRENCES OF *Malacothamnus clementinus* (SAN CLEMENTE ISLAND BUSH MALLOW), *Acmispon dendroideus* VAR. *traskiae* (SAN CLEMENTE ISLAND LOTUS), AND *Castilleja grisea* (SAN CLEMENTE ISLAND PAINTBRUSH)—Continued

Location description	Element occurrence (EO) # and point location (PL) [1]	Status [2] at listing; year of first record	Current status (reference)	Current threats [3]	Military use [4]
Larkspur Canyon (including Chamish Canyon).	EO 14 & 48; 15 PLs	Extant; 1981 CNDDB	Extant (SERG 2006—2011).	A: Land Use, Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	Low Military Value.
Box Canyon	EO 20 & 41; 22 PLs	Extant; 1979 CNDDB	Extant (SERG 2011)	A: Nonnative; E: Climate.	Low Military Value.
Upper Norton Canyon	EO 21; 6 PLs	Extant; 1979 CNDDB	Extant (SERG 2011)	A: Nonnative; E: Climate.	Low Military Value.
Middle Ranch Canyon	EO 24; 8 PLs	Extant; 1981 CNDDB	Extant (SERG 2008)	A: Nonnative; E: Climate.	Low Military Value.
Waymuck Canyon	EO 22; 1 PL	Unknown	Extant (Junak 2004)	A: Nonnative; E: Climate.	High Military Value.
Plain northeast of Warren Canyon.	No EO; 4 PLs	Unknown	Extant (Tierra Data 2007).	A: Land Use, Erosion, Nonnative; E: Movement, Climate.	Medium Military Value.
Seal Cove Terraces ...	EO 43; 2 PLs	Unknown	Extant (CNDDB 1985, SERG 2010).	A: Erosion, Nonnative, Fire; E: Movement, Fire, Climate.	High Military Value.
Eel Cove Canyon (including terraces).	No EO; 3 PLs	Unknown	Extant (Junak 2004)	A: Nonnative, Fire; E: Movement, Fire, Climate.	High Military Value.
Terrace Canyon (south to terraces around Spray).	No EO; 6 PLs	Unknown	Presumed Extant (SERG 2004).	A: Erosion, Nonnative; E: Movement, Climate.	High Military Value.
West Cove	No EO; 3 PLs	Unknown	Extant (Tierra Data 2006).	A: Land Use, Erosion, Nonnative; E: Movement, Climate.	Medium Military Value.

[1] EO: element occurrence, as defined and described according to the California Natural Diversity Database. PL: point locations of plants.
[2] Threats identified in the listing rule for these three taxa include: Factor A: habitat modification by feral animals; Factor C: grazing by animals; Factor E: nonnative plants.
[3] Current threats: Nonnative = Nonnative Plants; Movement = Movement of Vehicles and Troops; Climate = Climate Change; Genetic = Genetic Diversity.
[4] Military value as defined in the Navy's 2002 Integrated Natural Resources Management Plan (INRMP). Values defined according to the management emphasis, with high-value areas designated for maximum military use and low-value areas retaining the greatest flexibility for maintaining natural resource values.

Species Distribution—*Malacothamnus clementinus*

For many decades prior to its listing, *Malacothamnus clementinus* was only known from the type locality (the area where the species is first identified and described) at Lemon Tank Canyon, on the eastern side of the middle of the island (Kearney 1951, p. 128; USFWS 1984, p. 48). Dumping of scrap metal actually protected this occurrence from the ongoing threat of feral goat herbivory by preventing the goats from destroying the plants (USFWS 1984, p. 48). The historical range and distribution of *M. clementinus* on San Clemente Island is unknown because surveys were not carried out before the plant's decline. In the Recovery Plan, we noted that a public citizen commented in the Listing Rule on the discovery of two to three small plants on the edge of an inaccessible ledge in China Canyon (now described as two occurrences—Lower China Canyon and Upper China Canyon; 42 FR at 40683; USFWS 1984, p. 48). These two occurrences, along with the occurrence at Lemon Tank, were known at the time of listing. Since listing, eight new occurrences of *M. clementinus* have been discovered among the generally southwesterly facing coastal terraces and their associated escarpments in the southern and middle regions of San Clemente Island (Junak and Wilken 1998, pp. 1–416, GIS data; Junak 2006, pp. 1–176, GIS data; Tierra Data Inc. 2008, pp. 1–24, appendices and GIS data; SERG 2009–2011, GIS data; Figure 1). Many of these new occurrences have appeared since feral goats and pigs were removed from the island in the early 1990s. This suggests the possibility that the plants reemerged from underground stems that survived grazing by feral herbivores (Junak 2006a, pers. comm.).

Malacothamnus clementinus occurrences are scattered below canyon rims, at the base of terrace escarpments, and in flat areas from approximately Middle Ranch Canyon in the north to Horse Beach Canyon in the south. A large, genetically diverse occurrence is found within Horse Beach Canyon (Helenurm 1999, pp. 39–40). Ten of the 11 known occurrences are located throughout the southwestern region of the island; in addition, the Lemon Tank Canyon occurrence is located in the northeastern region of the island (Figure 1). Six of the occurrences are within SHOBA, and five are to the north outside of SHOBA. The main southern distribution of *M. clementinus* is disconnected from the historical type locality (the area where the species is first identified and described) of the species, which is the Lemon Tank Canyon occurrence. Lemon Tank lies about 3.6 mi (5.8 km) to the northeast of the nearest occurrence (Waymuck Canyon). The Lemon Tank Canyon occurrence has not been resurveyed since 1996, and its current status is uncertain and presumed extant (CNDDB

2011a, p. 2). Beyond the 11 known occurrences, there is an additional record of *M. clementinus* in the northern plateau area of the island, near Ridge Road, but this has not been confirmed despite targeted searches for the plant (SERG 2006, GIS data; Howe 2011a, pers. comm.). We are not considering this record as a known occurrence at this time due to the possibility of error.

The known range of *M. clementinus* has expanded to the south on San Clemente Island since its listing, with the distance between the northernmost and southernmost occurrence spanning about 9.5 mi (15.3 km). Occurrences within Impact Areas I and II in the southwestern portion of the island (within SHOBA) have not been surveyed since 2006, largely due to area closures implemented through the recent MOFMP (Navy 2008a, pp. 2–38 to 2–44; Munson 2011a, pers. comm.). Because of these closures, we were unable to evaluate the status of occurrences in Horse Beach Canyon, Lower China Canyon, and part of Upper China Canyon for this review. While the remaining eight occurrences fall outside of these Impact Areas, one of the largest and most genetically diverse of the 11 known occurrences, Horse Beach Canyon, is within the restricted area.

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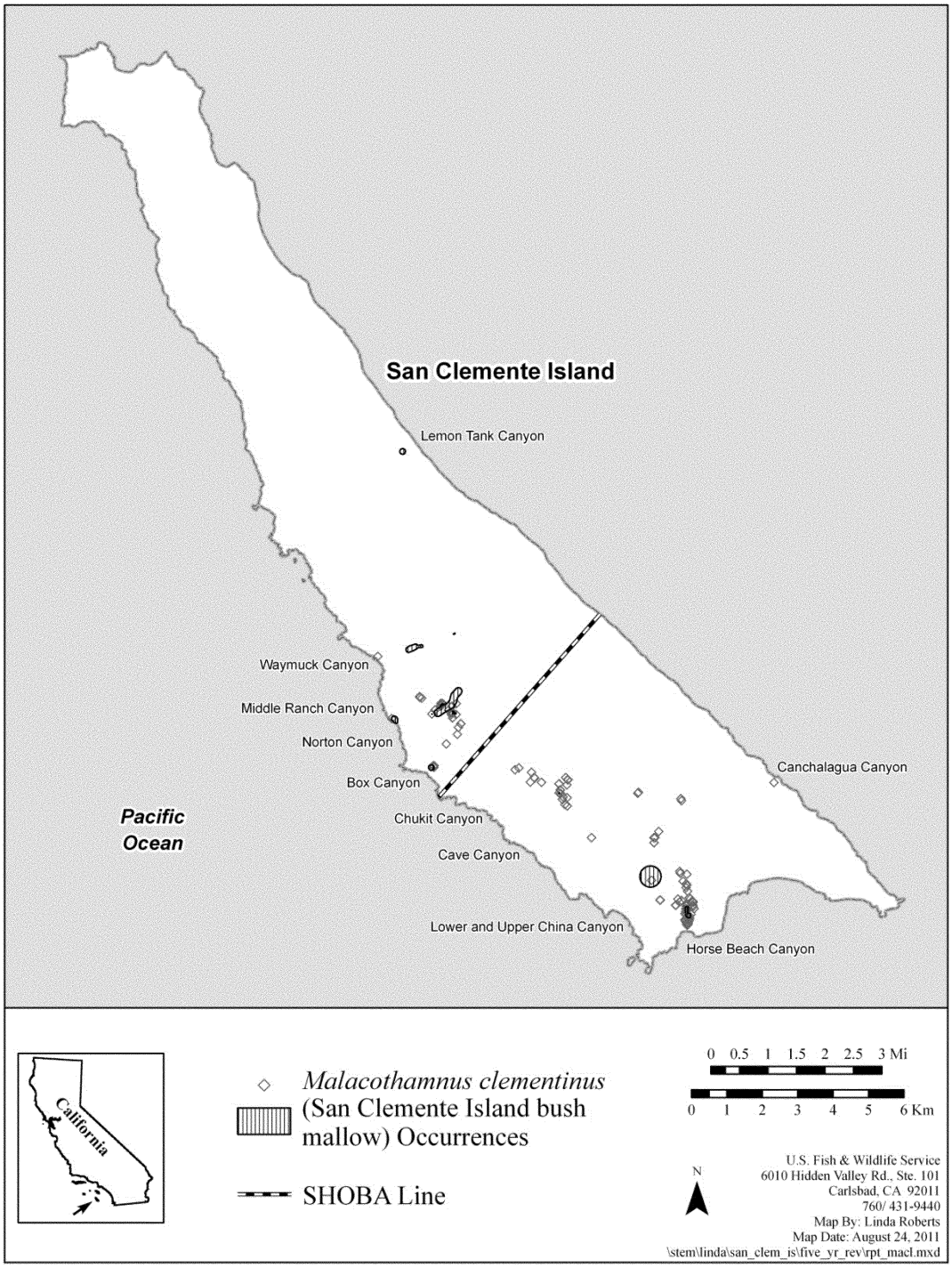

Figure 1. Distribution of 11 occurrences of *Malacothamnus clementinus* (San Clemente Island bush mallow) on San Clemente Island, Los Angeles County, California. General geographic location of each occurrence is indicated by name. Diamonds represent point locations and vertical striped polygons represent element occurrences.

Aerial stems of *Malacothamnus clementinus* can sprout from spreading underground stems (rhizomes). This makes it difficult to distinguish individual plants among groups of stems. Consequently, the size of an occurrence has been variously measured by counting the number of stem groupings or ''clumps,'' counting the total number of stems within a clump, and measuring the approximate area covered by plant groupings. These inconsistent survey methods make it difficult to document occurrence trends beyond the appearance of new

occurrences. There is no detailed information about the abundance (number or density of plants) of *M. clementinus* at the time of its listing in 1977 (42 FR 40683). Occurrences documented in 1996 to 1997 ranged in size from 1 to 50 clumps (Junak and Wilken 1998, p. 301). The Navy recently estimated 1,516 individuals of *M. clementinus* recorded since 2006 (Munson 2011d, pers. comm.). However, given the challenge in distinguishing individuals in a group of plants, and variability in methods of estimating the number of individuals, it is difficult to accurately quantify the abundance of *M. clementinus* on San Clemente Island and, as such, numbers should be interpreted cautiously.

Despite difficulties in determining species abundance, extensive surveys for *Malacothamnus clementinus* have detected 8 new occurrences since listing, for a total of 11 occurrences. This suggests that the species is responding favorably to the elimination of grazing pressure from feral herbivores on San Clemente Island. It is unknown to what extent this increase is attributable to more intensive survey efforts, detection of previously undetected individuals, recruitment from the seed bank, resprouting from rhizomes, recolonization associated with dispersal events, or management efforts.

Species Distribution—*Acmispon dendroideus* var. *traskiae*

Since the 1970s, the distribution of *Acmispon dendroideus* var. *traskiae* has been documented on north-facing slopes over most of the eastern and western sides of the island (USFWS 1984, p. 59; Junak and Wilken 1998, p. 256; Navy 2002, p. D–9; Junak 2006, p. 125). Twenty-nine occurrences of this taxon have been identified, which span the entire length of the island from Wilson Cove to the southern tip east of Pyramid Cove, a distance of approximately 19 mi (31 km) (Junak and Wilken 1998, p. 261; Junak 2006, Map A–C) (Figure 2). The majority of occurrences tend to be clustered on north-facing slopes on the eastern side of the island (Table 1). The distribution of *A. d.* var. *traskiae* spans the boundary of SHOBA at the southern end of the island: 8 occurrences fall within SHOBA and 21 are outside (Junak and Wilken 1998, pp. 1–416, GIS data; Junak 2006, pp. 1–176, GIS data; Tierra Data Inc. 2008, pp. 1–24, appendices and GIS data; SERG 2009–2011, GIS data). Approximately 13 of 29 (45 percent) of the occurrences (Wilson Cove, Canchalagua Canyon, Middle Island Plateau, North Mosquito Cove, Eagle Canyon, Larkspur Canyon, Chamish Canyon, Lemon Tank Canyon, Seal Cove Terraces, Eel Cove Canyon, Middle Wallrock Canyon, Warren Canyon, and North Island Terraces) are partially or wholly within the boundaries of a training area (IOA, TAR, or SWAT).

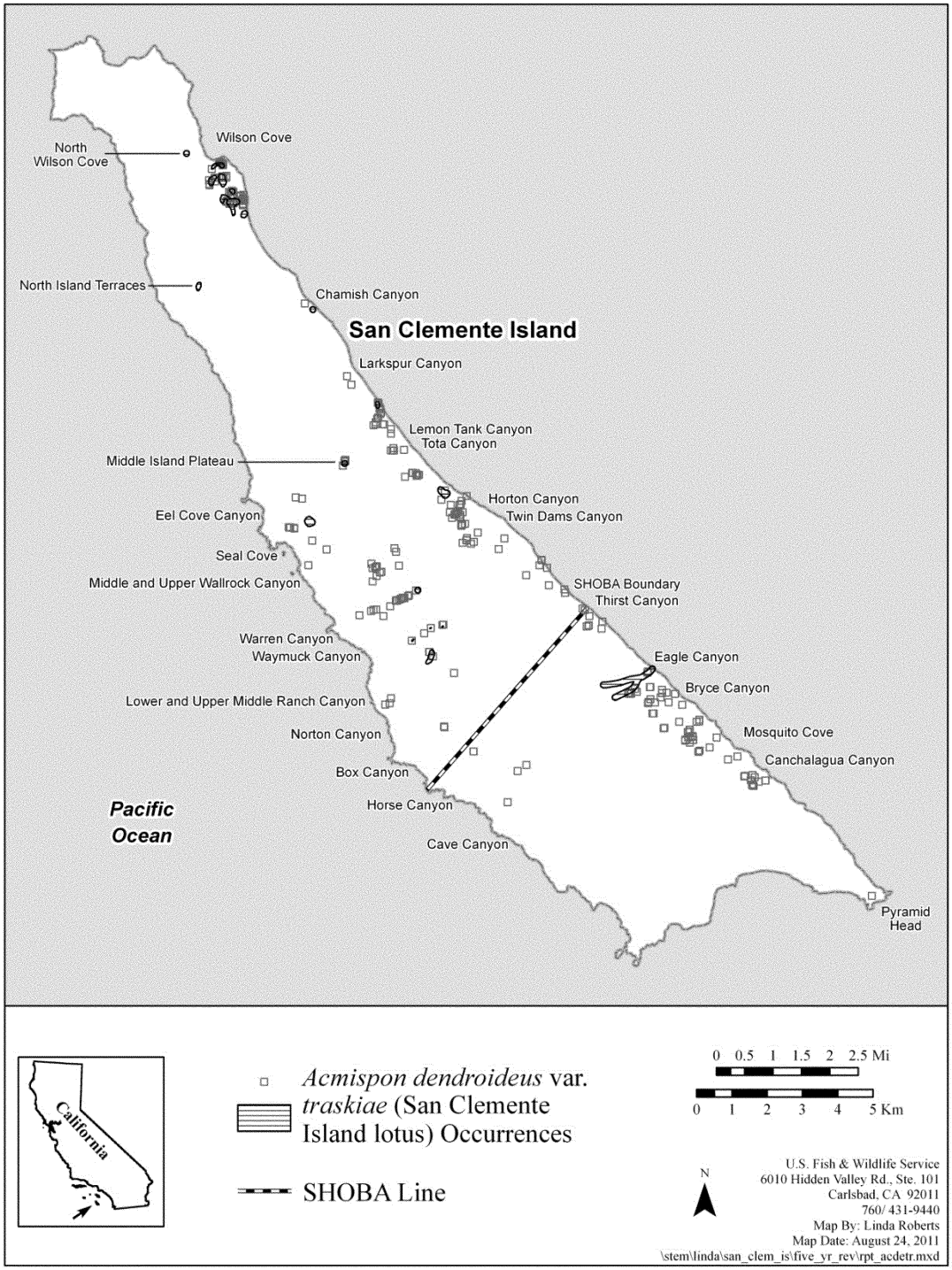

Figure 2. Distribution of 29 occurrences of *Acmispon dendroideus* var. *traskiae* (San Clemente Island lotus) on San Clemente Island, Los Angeles County, California. General geographic location of each occurrence is indicated by name. Squares represent point locations and horizontal striped polygons represent element occurrences.

Acmispon dendroideus var. *traskiae* tends to occur in small groups of 10 to 50 individuals (Allan 1999, p. 84). There is no information about the abundance of *A. d.* var. *traskiae* at the time of its listing in 1977. In the 1984 Recovery Plan (USFWS, p. 59), six occurrences of *A. d.* var. *traskiae* were recognized, all generally associated with rocky areas. However, no other specific information regarding species location or numbers of individuals at those six sites was provided in the Recovery Plan, except the statement that ''the largest number of plants grow in the vicinity of

Wilson Cove'' (USFWS 1984, p. 59). Additionally, there are only a few herbarium specimens of the taxon, making historical distribution and condition of the species difficult to assess. For purposes of comparison to the current status, we will use the number of occurrences cited in the recovery plan as the most conservative estimate of species' distribution around the time of its listing (Table 1). Thus, the historical range (based on herbarium records, CNDDB records, and the recovery plan) includes occurrences in the northern part of the island (Wilson Cove) down to the southern point (Pyramid Head).

CNDDB currently lists 14 element occurrences of *Acmispon dendroideus* var. *traskiae* (as *Lotus dendroideus* subsp. *traskiae*) (CNDDB 2011b) that are presumed extant. These occurrences are located on both the western and eastern sides of the island and are distributed across almost the entire length of the island. Recently, survey efforts have concentrated on discovering new plant occurrences, rather than tracking the status of historical occurrences (Junak 2006a, pers. comm.). New observations were mainly concentrated on north-facing slopes in the middle of the island, both on the eastern and western sides. Analysis of these newer point localities revealed proximity to individuals detected during the 1996 and 1997 surveys. These element occurrences and point localities combined total 29 separate *A. d.* var. *traskiae* occurrences (Table 1).

Abundance is difficult to determine for this species because range-wide surveys were not conducted each year. Instead, monitoring took place over multiple years with varying conditions. A recent estimate from the Navy reported 3,525 individuals of *Acmispon dendroideus* var. *traskiae* recorded since 2006 (Munson 2011d, pers. comm.). Even though there is uncertainty in the number of individuals, the number of occurrences has increased from 6 to 29. Thus, extensive survey findings suggest that *A. d.* var. *traskiae* has increased throughout most of its historical range, and there are more occurrences now than there were at the time of listing. It is unknown to what extent this increase is attributable to more intensive survey efforts, detection of previously undetected individuals, recruitment from the seed bank, recolonization associated with dispersal events, or management efforts. The increase in number of occurrences could indicate an increase in the distribution of *A. d.* var. *traskiae* on San Clemente Island.

Species Distribution—*Castilleja grisea*

Castilleja grisea was described as relatively common on San Clemente Island in the 1930s, and subsequently declined as a result of unchecked grazing by introduced feral herbivores (Helenurm *et al.* 2005, p. 1222). The historical range and distribution of *C. grisea* on San Clemente Island is unknown because botanical studies were not completed before the plant's decline. Herbarium records documented the species on the south and east sides of the island before the time of listing (California Consortium of Herbaria 2011, records for *C. grisea*). By 1963, *C. grisea* was reported as rare or occasional (Raven 1963, p. 337). Since the complete removal of goats and pigs from San Clemente Island in 1992, *C. grisea* has been detected across much of the island (Helenurm *et al.* 2005, pp. 1221, 1226; Junak 2006, p. 47; USFWS 2007c, p. 14). Plants have been recorded across the southern two-thirds of the island, and a single disjunct occurrence was documented at the northern end in West Cove (Junak and Wilken 1998, pp. 1–416, GIS data; Junak 2006, pp. 1–176, GIS data; Tierra Data Inc. 2008, pp. 1–24, appendices and GIS data; SERG 2009–2011, GIS data) (Figure 3). The distribution of any parasitic or hemiparasitic plant is limited by the distribution of its host or hosts. However, host availability does not appear to be limiting the abundance of this species.

The linear distance between the northernmost and southernmost occurrences is 19.7 mi (32 km), with plants primarily distributed across the southern 15.5 mi (25 km) of the island. Occurrences on the southern end of the island on both the western and eastern sides are reported in the CNDDB (CNDDB 2011c). We combined CNDDB element occurrences with adjacent point localities from island surveys to identify *Castilleja grisea* occurrences (Table 1). The known distribution for *C. grisea* documented since 1992 reflects a more continuous and slightly expanded distribution since the time of listing (Tierra Data Inc. 2008, p. B–3). Survey efforts have concentrated on discovering new occurrences rather than tracking the status of historical occurrences (Junak, 2006a, pers. comm.). Using available GIS and distribution data, we have determined there are 29 occurrences of *C. grisea* currently on the island; only 19 of these were known at listing.

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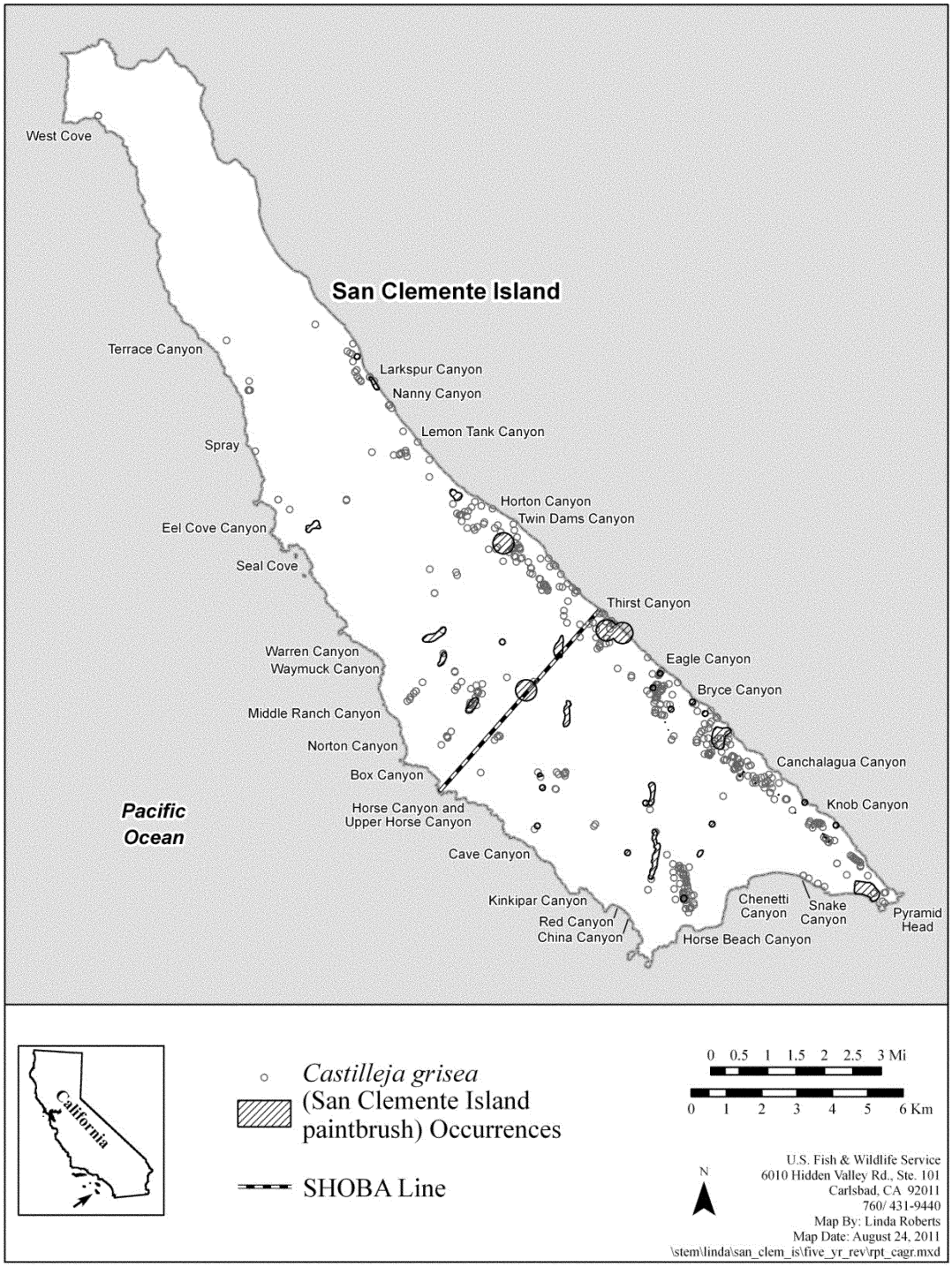

Figure 3. Distribution of 29 occurrences of *Castilleja grisea* (San Clemente Island paintbrush) on San Clemente Island, Los Angeles County, California. General geographic location of each occurrence is indicated by name. Circles represent point locations and diagonal striped polygons represent element occurrences.

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(Table 1). The extant occurrences at listing are derived from herbarium records, CNDDB records, and information in the Recovery Plan. Distribution of *C. grisea* extends into SHOBA at the southern end of the island; 15 occurrences fall within and 14 outside of SHOBA.

A number of surveys have found new occurrences throughout the island (Junak and Wilken 1998, GIS data; Junak 2006, GIS data; Tierra Data Inc. 2008, GIS data; SERG 2009–2011, GIS data; CNDDB 2011c). Most new observations were concentrated in steep canyons on the western side of the island, although a few were discovered near previously

recorded individuals in the eastern canyons. Recent counts, based on the Navy's data, estimate 11,733 individuals of *Castilleja grisea* since 2006 (Munson 2011d, pers. comm.). Extensive survey efforts since 1992 suggest *C. grisea* has filled in its known historical range on the island, and there are more individuals now than at listing. Even though there is uncertainty in the number of individuals, the number of occurrences of species has increased from 19 to 29. It remains unknown how much of this apparent increase in range density can be attributed to more intensive survey efforts, detection of previously undetected individuals, recruitment from the seed bank, recolonization associated with dispersal events, or management efforts. However, the increase in the number of occurrences suggests an expansion of the species across the island.

Habitat

General Habitat Conditions

Current habitat conditions for *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* on San Clemente Island are the result of present and historical land use practices. San Clemente Island has been inhabited by humans for thousands of years (Schoenherr *et al.* 1999, p. 317). There is evidence that the Gabrielino people used the island for harvesting marine organisms before European settlers arrived. The first lease for sheep ranching was granted in 1848 (Schoenherr *et al.* 1999, p. 317). From 1850 until 1934, San Clemente Island was used for sheep and cattle ranching, goat grazing, and pig farming (Navy 2002, pp. 3–4). Some accounts even report goats present on the island as early as 1827 (Dunkle 1950, p. 261). These nonnative herbivores greatly changed the vegetative landscape of San Clemente Island, and were cited in the final listing rule (42 FR 40682; August 11, 1977) for *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* as the main cause of these species' decline. Sheep were removed from the island in the 1930s, but feral goats and pigs were not completely eradicated until 1992. Since the removal of goats and pigs, the vegetation on San Clemente Island has rebounded, and the condition of many rare plants has improved (Junak 2006a, pers. comm.). As a persistent historical impact to the landscape, overgrazing also led to the creation of bare trails, denuded areas, and severe erosion. Grazing animals also facilitated the introduction and spread of nonnative plants. Specifically, nonnative grasses were spread through grazing and ranching on the island (Navy 2002, p. 3–31).

Fire

Past and current fire regimes (pattern, frequency, and intensity of fire in an area) have influenced the distribution of native and nonnative plants on San Clemente Island (Navy 2002, p. 3–28). Although the natural fire regime of the island is unknown, there have only been three documented lightning ignitions of wildfires on the Channel Islands in 140 years (Carroll *et al.* 1993, p. 83). Natural fire ignition was probably rare, as lightning-caused fires tend to be less frequent with proximity to the coastline, due to higher fuel moisture levels and a cooler climate (Keeley 1982, pp. 436–437; Keeley 2002, p. 305). While the island was used for ranching, fires were set intermittently to increase the forb and grass cover (Navy 2002, p. 3–29). After purchase by the Navy in 1934, fire ignited by military training activities became a more common occurrence throughout much of the island.

It was assumed in previous descriptions that *Malacothamnus clementinus* is adapted to, and tolerant of, the periodic fires that probably occurred in a prehistorical, lightning-ignition fire regime, although there is no direct research to support this assumption (USFWS 1984. p. 48; Navy 2002, D–20; USFWS 2007a, p. 3). Other species in the same genus are fire tolerant and able to adapt, such as *Malacothamnus fremontii* (Fremont's bushmallow), a primary successional species that can form the major shrub cover after a fire (Rundel 1982, p. 86). The seeds of *M. fremontii* are stimulated by heat shock treatments, suggesting that it is adapted to germinate after fires (Keeley *et al.* 2005, p. 175). Another related species, *M. fasciculatus* (Mendocino bushmallow), germinates after being stimulated by heat and is known to flourish after fires (Swensen *et al.* 1995, pp. 412–413; Beyers and Wakeman 1997, p. 2). *Malacothamnus clementinus* has underground stems, and can resprout after disturbance to reproduce vegetatively. The fire tolerance of the genus and its ability to resprout suggest that *M. clementinus* may be adapted to fire. Although no direct research has been done on the effects of fire on *M. clementinus,* its continued presence in areas that have burned (such as SHOBA) indicates that it is tolerant of at least occasional fire (intervals of at least 5 years) (Navy 2008b, pp. 3.11–24, 3.11–81). However, frequent fires could exceed its tolerance of fire intensity and frequency.

The fire tolerance of *Acmispon dendroideus* var. *traskiae* is unknown. Some studies have shown that the related mainland species, *Lotus scoparius* (deerweed), is fire tolerant and becomes more abundant in years after fire (Nilsen and Schlesinger 1981, p. 217; Westman and O'Leary 1986, pp. 184–185). Other studies indicate that intense or frequent burns (three times in 6 years) of *L. scoparius* lead to establishment of fewer seedlings (Westman and O'Leary 1986, p. 185; Haidinger and Keeley 1993, p. 141). In San Clemente Island species, observations show that *Acmispon argophyllus* var. *adsurgens* (San Clemente Island bird's-foot trefoil) germination is slowed or depressed after fire, but *A. argophyllus* var. *argenteus* (silver bird's-foot trefoil) flourishes in burn areas (Allan 1999, pp. 90–91). Observations of *A. d.* var. *traskiae* before and several years following a fire in Canchalagua Canyon found that adult plants were usually killed by fire, but were replaced with a similar number of seedlings after the fire (Navy 2002, p. D–10; Tierra Data Inc. 2005, p. 80). Based on *A. d.* var. *traskiae*'s growth characteristics and occurrence increases in areas affected by fire, and the fire adaptations of related species, *A. d.* var. *traskiae* may be resilient to at least occasional fire. Frequent fires could exceed its tolerance of fire intensity and frequency, and exhaust the seed bank in repeatedly burned areas. Until studies can be conducted specifically on *A. d.* var. *traskiae,* it is prudent to avoid the conclusion that the species benefits from, or germinates with, fire.

The fire tolerance of *Castilleja grisea* is unknown at this time. We do not know of any studies conducted on the fire tolerance of this species, and there is very little information from related species to infer fire tolerance for the genus *Castilleja.* A related rare species, *C. levisecta* (golden Indian paintbrush), tolerates fire and performs better in areas that have burned in the past (Dunwiddie 2002, p. 1; Dunwiddie 2009, p. 5). *Castilleja grisea* has survived and expanded its distribution in areas that have burned. It is generally assumed that the species has some tolerance of infrequent fire (Navy 2002, D–32) based on *C. grisea* occurrence increases in areas affected by fire, and the fire adaptations of other plants in the genus. However, until species-specific research is conducted, we cannot conclude with certainty that *C. grisea* is adapted to fire. Additionally, research is needed on the fire tolerance of potential host plants and their impacts on establishment of *C. grisea.*

Although the three species share the same island habitat, they inhabit different niches. The habitat

characteristics of each species are discussed below.

Habitat—*Malacothamnus clementinus*

Malacothamnus clementinus occurs in a variety of habitats on San Clemente Island. Historically, it was observed on rocky canyon walls and ridges, presumably because foraging goats did not graze those areas. More recently, *M. clementinus* has been found at the base of escarpments between coastal terraces on the western side of the island within maritime cactus scrub (Navy 2002, pp. D–19, D–20). It can also occur on low canyon benches and in rocky grasslands. *Malacothamnus clementinus* is found at approximately 30 to 900 ft (10 to 275 m) elevation (CNPS 2001, p. 215). Moisture that collects in rock crevices and at the base of canyon walls and escarpments may provide favorable conditions for this species (Junak 2006a, pers. comm.). Based on its habitat range on the island and the ease of cultivating the plant, *M. clementinus* appears to tolerate a broad range of soil types (USFWS 1984, p. 50). It is often associated with maritime cactus scrub vegetation on coastal flats at the southwestern end of the island (Junak and Wilken 1998, p. 256). In the INRMP, *M. clementinus* is listed as associated with canyon woodlands (approximately 696 ac (282 ha)), maritime desert scrub-prickly pear vegetation community (approximately 8,921 ac (3,610 ha)), and maritime sage scrub (approximately 369 ac (149 ha)) (Navy 2002, pp. 3–57, 3–63, 3–66). According to Junak and Wilken (1998, p. 290), it is associated with numerous plant species, including: *Artemisia californica* (California sage brush), *Avena fatua* (wild oat), *Bromus* spp. (brome grass), *Calystegia macrostegia* subsp. *amplissima* (island morning glory), *Encelia californica* (California brittlebush), *Nassella cernua* (nodding needlegrass), *Nassella lepida* (foothill stipa), *Opuntia littoralis* (western prickly pear), *Opuntia oricola* (chaparral prickly pear), *Opuntia prolifera* (cholla), and *Rhus intergrifolia* (lemonade sumac).

Habitat—*Acmispon dendroideus* var. *traskiae*

Acmispon dendroideus var. *traskiae* occurs on north-facing slopes, canyon bottoms, or ridgelines (Junak 2006, p. 125). Plants grow somewhat colonially around rock outcrops and boulders in grassy areas, and along the interface between grassland and maritime sage scrub (Allan 1999, p. 84; Navy 2002, p. D–9). *Acmispon dendroideus* var. *traskiae* occurs between 25 and 1,400 ft (7.6 to 463 m) in elevation on well-drained soils where adequate soil moisture is available to the plant (Junak and Wilken 1998, p. 256; Navy 2002, p. D–9). Some plants have been found in close proximity to buildings, roads, and pipelines, indicating that *A. d.* var. *traskiae* is capable of colonizing disturbed areas (Allan 1999, p. 84; Navy 2002, p. D–9). *A. d.* var. *traskiae* is associated with two habitat types on the island: Canyon woodland supported on approximately 696 ac (282 ha) and maritime desert scrub along the northeastern escarpment supported on approximately 6,228 ac (2,520 ha) (Navy 2002, pp. 3–57, 3–58). According to Junak and Wilken (1998, p. 256), *A. d.* var. *traskiae* is associated with numerous plant species including, but not limited to: *Artemisia californica, Avena fatua, Bromus* spp., *Calystegia macrostegia* subsp. *amplissima, Dichelostemma capitatum* (wild hyacinth), *Gnaphalium bicolor* (bicolored everlasting), *Hemizonia clementina* (island tarplant), *Opuntia* spp. (prickly pear), *Nassella pulchra* (purple stipa), and *Quercus tomentella* (island live oak).

Habitat—*Castilleja grisea*

Castilleja grisea is often associated with coastal sage scrub found on approximately 369 ac (149 ha) of the island and maritime desert scrub plant communities found on approximately 5,858 ac (2,371 ha), with scattered concentrations of plants in canyon woodland (approximately 696 ac (282 ha)) and grassland habitat (approximately 8,921 ac (3,610 ha)) (Navy 2002, pp. 3–58, 3–63, 3–66). Plants are located in steep, rocky canyons on both the eastern escarpment and western side of the island, although some have been observed on coastal bluffs, slopes, and terraces around the island's perimeter. Some of the largest concentrations of plants are located in bowl-shaped swales on coastal terraces (Junak and Wilken 1998, p. 82). *Castilleja grisea* grows between 32 and 2,000 ft (10 and 365 m) in elevation. This hemiparasitic plant is known to parasitize many different plants, although a definitive understanding of host-plant associations is currently unknown. Potential host plants include *Calystegia macrostegia* subsp. *amplissima* (island morning glory), *Opuntia littoralis* (prickly pear), and *Constancia nevinii* (Nevin's eriophyllum). These may be important habitat components for *C. grisea.* Junak and Wilken (1998, p. 82) suggest that habitat conditions must be of sufficient quality to sustain potential host plants and provide opportunities for *C. grisea* establishment. Numerous plant species are associated with *C. grisea* including, but not limited to: *Artemisia californica, Calystegia macrostegia* subsp. *amplissima, Encelia californica, Constancia nevinii* (Nevin's woolly sunflower), *Hemizonia clementina, Isocoma menziesii* (Menzies' goldenbush), *Lycium californicum* (California boxthorn), and *Opuntia* spp. (Junak and Wilken 1998, p. 82).

Biology and Genetics

Biology—*Malacothamnus clementinus*

Malacothamnus clementinus is an herbaceous clonal plant (descended asexually from a single individual) that may spread locally by underground rhizomes that produce aerial stems. On average there are 90 flowers per inflorescence (a flower cluster) (Junak and Wilken 1998, p. 291). The species flowers in the spring, typically from March to August (Kearney 1951, p. 115; Navy 2002, D–19; California Native Plant Society 2011). Junak and Wilken (1998, p. 291) found that *M. clementinus* is self-compatible (capable of self-fertilization), but not self-pollinating. The plant produced seed when hand pollinated with pollen from the same plant, but not when flowers were bagged to prevent pollinator visitations (Junak and Wilken 1998, p. 291). It is generally thought that *M. clementinus* is pollinated by insects, although no specific pollinator for this species is known. Other species in the family *Malvaceae* are pollinated by specialist bees in the genus *Diadasia* (Sipes and Tepedino 2005, p. 487). Given the evidence that suggests pollinators may be necessary for successful seed production, a decline in *M. clementinus* may in part be due to a decline in pollinators or an absence of pollinator visitations (Junak and Wilken 1998, p. 291).

Each fertilized flower produces three to four seeds on average (Junak and Wilken 1998, p. 291). Seed production in natural occurrences of *Malacothamnus clementinus* is very low (Helenurm 1997, p. 51; Helenurm 1999, p. 39; Junak 2006a, pers. comm.), as is germination, with low germination rates of only 4 to 35 percent (Evans and Bohn 1987, p. 538; Junak and Wilken 1998, p. 291). Junak and Wilken (1998, p. 291) hypothesized that the relatively low number of seeds produced *in situ* could be due to low pollinator visitation rates or some other unknown factor. Seed germination may be stimulated by heat associated with fire in other *Malvaceae* species, although this has not been studied in *M. clementinus* (Keeley *et al.* 2005, p. 175). Junak and Wilken (1998, p. 291) tried scarifying seeds (softening the outer coat of a seed through

mechanical or chemical means) to promote germination, but this did not significantly increase germination rates. Based on these limited studies of seed production and germination in *M. clementinus,* it is difficult to determine the cause of its low reproductive output.

In addition to sexual reproduction, *Malacothamnus clementinus* can reproduce vegetatively, or clonally, by sprouting from rhizomes (Evans and Bohn 1987, p. 538). Because *M. clementinus* typically occurs in clusters of stems, it is difficult to differentiate between individuals, as rhizome sprouts can also look like seedlings. Therefore, it can be a challenge to determine in the field if a small plant is a seedling or a sprout without digging up the root system (Junak 2006b, pers. comm.). The life history of *M. clementinus* suggests that many of the newly detected occurrences have sprouted from underground rhizomes (Junak 2006a, pers. comm.).

Genetics—*Malacothamnus clementinus*

Genetic studies have provided insights into the clonal nature of *Malacothamnus clementinus.* Overall, genetic diversity found in the *M. clementinus* occurrences is very low compared with other island endemic plant taxa (Helenurm 1999, p. 40). However, individuals in a patch do not represent the same genetic individual, and there is genetic diversity within patches of *M. clementinus* (Helenurm 1999, p. 39). A substantial proportion of the genetic diversity in *M. clementinus* is found among different occurrences rather than within a single occurrence. This research indicates that each occurrence may contain unique genetic variation not found elsewhere, and that there is not much cross pollination or gene flow between occurrences or even patches in the same area (Helenurm 1999, pp. 39–40); this underscores the high conservation value of each of the different occurrences to the long-term survival and recovery of the species.

Malacothamnus clementinus may have low genetic fitness due to small occurrence numbers, low seed production, and low genetic diversity. Helenurm (1999, p. 40) found that most of the species' genetic variation is within the Box Canyon and Horse Beach Canyon occurrences, although other occurrences may contain unique genetic material not found elsewhere (Helenurm 1999, p. 40). Occurrences of *M. clementinus* could be vulnerable to inbreeding depression (loss of vigor and general health) and reduced seed production due to apparently limited outcrossing (reproduction between individuals of different strains) of the plant (Helenurm 1997, p. 50; Helenurm 1999, p. 40).

Biology—*Acmispon dendroideus* var. *traskiae*

Acmispon dendroideus var. *traskiae* flowers between February and August, with halictid bees (a family of small solitary bees that typically nest in the ground), bumblebees, and small beetles observed foraging on the flowers (Junak and Wilken 1998, p. 257; Allan 1999, pp. 64, 85). The taxon is self-compatible (Allan 1999, pp. 85–86), but plants may also rely on insects for more effective pollination (Arroyo 1981, pp. 728–729). Fertilized ovaries develop into a slender, beak-like fruit 1 to 2 in (2.5 to 5 cm) long containing up to six seeds (Isely 1993, p. 619; Junak and Wilken 1998, p. 257; Allan 1999, p. 82). The fruits do not split open to release their seeds at maturity (Isely 1993, p. 619), so it is likely that they disperse close to the parent plants, which may limit the ability of *A. d.* var. *traskiae* to colonize unoccupied suitable habitat. Junak and Wilken (1998, p. 257) found that, on average, a single *A. d.* var. *traskiae* individual can produce approximately 36 to 64 flowering shoots, 118 to 144 flowers per shoot, and 4 to 6 seeds per fruit. This suggests that, under ideal conditions, an individual *A. d.* var. *traskiae* can produce a high volume of seeds (16,000 or more). Like most legumes, *A. d.* var. *traskiae* seeds require scarification or gradual seed coat degradation to germinate (Wall 2011, pers. comm.).

Genetics—*Acmispon dendroideus* var. *traskiae*

Allan (1999, pp. 1–105) analyzed 10 California mainland and Channel Island taxa of *Lotus* (all of which are now in the genus *Acmispon* and referred to as such here), including *Acmispon dendroideus* var. *traskiae.* Of the 29 occurrences of *A. d.* var. *traskiae* on San Clemente Island, Allan (1999, pp. 50–53) sampled only the Wilson Cove occurrence. The *Acmispon* island populations, including *A. d.* var. *traskiae,* tended to have lower genetic variability than mainland populations (Allan 1999, p. 63). There are several possible explanations for this lower genetic variation, including small occurrence size, genetic bottlenecks associated with the establishment of new island occurrences, stochastic events (a random incident such as local extinctions), and genetic isolation (Allan 1999, p. 63). Allan's (1999, p. 61) analysis of genetic diversity also found that the majority (67 percent) of *A. d.* var. *traskiae's* variability is found among, rather than within, occurrences. He postulated that the low genetic variability within a given occurrence may be due to endemism (native to or confined to a certain region), partial inbreeding, isolation, and stochastic events in small occurrences (Allan 1999, pp. 63–64).

Acmispon dendroideus var. *traskiae* has been known to hybridize with *A. argophyllus* var. *argenteus* in disturbed areas in Wilson Cove (Liston *et al.* 1990, pp. 239–240; Allan 1999, p. 86). Based on intermediate characteristics, the hybrid plants appear to be first generation plants (F_1 generation) from a cross between the two varieties. It is not known whether these plants are capable of producing viable seeds by backcrossing between the hybrids or with the putative parent plants (Allan 1999, p. 86). Plants of intermediate morphology were first observed by R.M. Beauchamp in 1986 (Liston *et al.* 1990, p. 239). In April 1989, Liston *et al.* (1990, pp. 239–240) noted a small number of suspected hybrids in the same area as the largest known occurrence of *A. d.* var. *traskiae* in Wilson Cove. A smaller group of nonhybrid *A. argophyllus* var. *argenteus* was found approximately 80 ft (24.4 m) upwind; the two taxa were separated by a road. No documented evidence of hybridization has been recorded anywhere else on the island (Allan 1999, p. 86), although there are unconfirmed reports in other areas (e.g., Warren Canyon; A. Braswell 2011, pers. obs.).

Biology—*Castilleja grisea*

All taxa of *Castilleja* are considered hemiparasitic. Plants are capable of photosynthesis and can exist without a host, but are able to derive water, nutrients, or photosynthates from a host plant if present (Heckard 1962, p. 25). *Castilleja* roots have haustorial attachments (specialized absorbing structures) that penetrate the host plant's root tissue, forming an organic bridge with the host (Heckard 1962, p. 27). In field settings, species of *Castilleja* tend to establish haustorial connections with one or more hosts (Heckard 1962, p. 27; Atsatt and Strong 1970, p. 280). In greenhouse studies, seedlings of *C. grisea* grown in the absence of host plants did not perform well and died shortly after germination, suggesting that host plants are important for this species (Junak and Wilken 1998, p. 84). Greenhouse studies have also shown that overall performance and fecundity of parasitic plants are usually higher with a host than without one (Heckard 1962, p. 29; Atsatt and Strong 1970, p. 280).

Castilleja grisea appears to be capable of forming haustorial connections with a range of plant species (Heckard 1962, p. 28; Atsatt and Strong 1970, p. 280; Marvier 1996, p. 1399; Adler 2002, p. 2704; Adler 2003, p. 2086). *Nassella pulchra, Calystegia macrostegia* subsp. *amplissima,* and *Constancia nevinii* are considered potential hosts (Muller 2009, pers. comm.). Twelve co-occurring plant taxa have been found consistently in *C. grisea* occurrences (Muller and Junak 2011, p. 5). However, further study is needed to determine which of these plants serve as hosts to *C. grisea,* and at what frequency. *Castilleja grisea* may rely on more than one host species for growth and reproduction. Therefore, recovery may depend on the conservation of a community of host species (Marvier and Smith 1997, p. 846).

Castilleja grisea flowers between February and May, producing yellow bisexual flowers (Chuang and Heckard 1993, pp. 1016–1024; Navy 2002, p. D–31). *Castilleja grisea* is likely self-incompatible (unable to produce viable seed through self-fertilization), as observed in other species of the genus (Carpenter 1983, p. 218; Junak and Wilken 1998, p. 84). Among four populations of *C. grisea* examined, Junak and Wilken (1998, pp. 83–84) found limited flower-to-fruit conversion (67 to 71 percent of flowers produced fruits) and large variation in the number of seeds set per fruit. *Castilleja grisea* appears to produce seed primarily through outcrossing, and relies on pollinators for sexual reproduction (Junak and Wilken 1998, p. 84; Helenurm *et al.* 2005, p. 1225).

Castilleja grisea is most closely related to, and shares floral traits with, other species in the genus primarily adapted for bee pollination (Chuang and Heckard 1991, p. 658). A single bee from the family Andrenidae, covered in pollen, was recently collected from a flowering *C. grisea* plant in Canchalagua Canyon on San Clemente Island (Howe 2009a, pers. comm.). The fruit of *C. grisea* is an ovoid capsule, less than 0.5 in (1.27 cm) long, and contains approximately 150 seeds (Junak and Wilken 1998, pp. 82–83). The seed coats are deeply netted, which indicates they can float and may be able to disperse via water (Muller and Junak 2011, pp. 12, 16). During attempts to propagate *C. grisea* plants from seed, no significant differences were found between seed viability (79.5 to 85 percent) and germination (68.3 to 76.7 percent), suggesting that most viable seed are able to germinate immediately without a period of dormancy to induce germination (Junak and Wilken 1998, pp. 83–84).

Genetics—*Castilleja grisea*

Genetic variation within *Castilleja grisea* is moderately high for an insular endemic plant, particularly given its history of extreme rarity (Helenurm *et al.* 2005, p. 1225). This suggests *C. grisea* may have retained substantial genetic variation through the period of overgrazing. Consistent with an outcrossing breeding system, most of the genetic variation in C. *grisea* is within, rather than among, occurrences (Helenurm *et al.* 2005, p. 1225). Historically, there were likely high rates of gene flow between occurrences. The transmittal of genes between occurrences in the past influenced the genetic similarity found between occurrences by Helenurm *et al.* (2005, p. 1226). While all occurrences are important for maintaining levels of gene flow, the loss of any single occurrence is unlikely to represent a significant loss of genetic diversity to the species (Helenurm *et al.* 2005, p. 1226). Overall, this species likely does not have low fitness due to limiting genetic factors (Helenurm *et al.* 2005, p. 1226).

Recovery

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. The Act directs that, to the maximum extent practicable, we incorporate into each plan:

(1) Site-specific management actions that may be necessary to achieve the plan's goals for conservation and survival of the species;

(2) Objective, measurable criteria, which when met would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the list; and

(3) Estimates of the time required and cost to carry out the plan.

However, revisions to the list (adding, removing, or reclassifying a species) must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is endangered or threatened (or not) because of one or more of five threat factors. Therefore, recovery criteria must indicate when a species is no longer endangered or threatened by any of the five factors. In other words, objective, measurable criteria, or recovery criteria contained in recovery plans, must indicate when we would anticipate an analysis of the five threat factors under section 4(a)(1) would result in a determination that a species is no longer endangered or threatened. Section 4(b) of the Act requires that the determination be made ''solely on the basis of the best scientific and commercial data available.''

Thus, while recovery plans are intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. Determinations to remove a species from the list made under section 4(a)(1) of the Act must be based on the best scientific and commercial data available at the time of the determination, regardless of whether that information differs from the recovery plan.

In the course of implementing conservation actions for a species, new information is often gained that requires recovery efforts to be modified accordingly. There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met. For example, one or more recovery criteria may have been exceeded while other criteria may not have been accomplished, yet the Service may judge that, overall, the threats have been minimized sufficiently, and the species is robust enough, that the Service may reclassify the species from endangered to threatened or perhaps delist the species. In other cases, recovery opportunities may have been recognized that were not known at the time the recovery plan was finalized. These opportunities may be used instead of methods identified in the recovery plan.

Likewise, information on the species may be learned that was not known at the time the recovery plan was finalized. The new information may change the extent that criteria need to be met for recognizing recovery of the species. Overall, recovery of species is a dynamic process requiring adaptive management, planning, implementing, and evaluating the degree of recovery of a species that may, or may not, fully follow the guidance provided in a recovery plan.

Thus, while the recovery plan provides important guidance on the direction and strategy for recovery, and indicates when a rulemaking process may be initiated, the determination to remove a species from the Federal List of Endangered and Threatened Plants (50 CFR 17.12) is ultimately based on an

analysis of whether a species is no longer endangered or threatened. The following discussion provides a brief review of recovery planning for *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea,* as well as an analysis of the recovery criteria and goals as they relate to evaluating the status of the taxa.

In 1984, the Service published the Recovery Plan for the Endangered and Threatened Species of the California Channel Islands (Recovery Plan) that addresses 10 plants (including *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea*) and animals distributed among three of the Channel Islands (USFWS 1984). Recovery plans are intended to guide actions to recover listed species and to provide measurable objectives against which to measure progress towards recovery. Following guidance in effect at that time, the Recovery Plan was not focused on criteria that specifically addressed the point at which threats identified for each species in the listing rule would be removed or sufficiently ameliorated. Given the threats in common to the 10 species addressed, the Recovery Plan is broad in scope and focuses on restoration of habitats and ecosystem function. Instead of specific criteria, it included six general objectives covering all 10 of the plant and animal species:

Objective 1: Identify present adverse impacts to biological resources and strive to eliminate them.

Objective 2: Protect known resources from further degradation by: (a) Removal of feral herbivores, carnivores, and selected exotic plant species; (b) control of erosion in sensitive locations; and (c) direct military operations and adverse recreational uses away from biologically sensitive areas.

Objective 3: Restore habitats by revegetation of disturbed areas using native species.

Objective 4: Identify areas of San Clemente Island where habitat restoration and population increase of certain addressed taxa may be achieved through a careful survey of the island and research on habitat requirements of each taxon.

Objective 5: Delist or upgrade the listing status of those taxa that achieve vigorous, self-sustaining population levels as the result of habitat stabilization, restoration, and preventing or minimizing adverse human-related impacts.

Objective 6: Monitor effectiveness of recovery effort by undertaking baseline quantitative studies and subsequent follow-up work (USFWS 1984, pp. 106–107).

Progress has been made toward achieving these objectives. Our review of the Recovery Plan focuses on the actions identified that promote the recovery of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea.* The Recovery Plan adopts a generalized strategy of eliminating or controlling selected nonnative species and restoring habitat conditions on the Channel Islands to support viable, self-sustaining occurrences of each of the addressed taxa. The Recovery Plan states that ''[o]nce the threats to these taxa have been removed or minimized and the habitats are restored, adequately protected, and properly managed, reclassification for some taxa may be considered'' (USFWS 1984, p. 108). Actions specified in the Recovery Plan that are pertinent to recovery of the endangered San Clemente Island plant taxa include:

(1) Removing feral animals;

(2) Removing or controlling selected nonnative plants;

(3) Controlling erosion;

(4) Revegetating eroded and disturbed areas;

(5) Reintroducing and reestablishing listed plant species populations;

(6) Modifying existing management plans to minimize habitat disturbance and incorporate recovery actions into natural resource management plans;

(7) Protecting habitat by minimizing habitat loss and disturbance and by preventing the introduction of additional nonnative organisms;

(8) Determining the habitat and other ecological requirements of the listed plant taxa (such as reproductive biology and fire tolerance);

(9) Evaluating the success of management actions;

(10) Increasing public support for recovery efforts; and,

(11) Using existing laws and regulations to protect each taxon.

Recovery Plan Implementation

The primary objective of the Recovery Plan is to restore endangered and threatened species to nonlisted status. Though specific size and number of occurrences needed for self-sustaining populations for each species was not identified, habitat restoration and protection that would result in achieving self-sustaining populations (see Objective 5) were discussed. The Recovery Plan stated that reclassification of these taxa may be considered after threats have been removed or sufficiently minimized and the habitat is restored. Specific criteria for determining when threats have been removed or sufficiently minimized were not identified in the Recovery Plan, but six objectives were described in general to achieve recovery of the Channel Island species. This section provides a summary of actions and activities that have been implemented according to the 1984 Recovery Plan (USFWS 1984, pp. 106–107) and contribute to achievement of these objectives.

Objective 1: Identify Present Adverse Impacts to Biological Resources and Strive To Eliminate Them

The Navy has taken steps to eliminate incidental impacts to the three species by educating Navy personnel stationed on San Clemente Island. To increase support for recovery efforts, the Navy has created the position of Island Operations Manager. This individual's role is to act as a liaison between the Navy's natural resource branch and other island users (Larson 2009, pers. comm.). The Island Operations Manager educates users of the island to the uniqueness and fragility of the island's ecosystem, and briefs new operational groups as they come onto the island (Larson 2009, pers. comm.). These briefings inform operational groups of the Navy's natural resource management responsibilities under the law, and may include additional information about threats to, and locations of, listed taxa.

The Recovery Plan recommends that existing laws and regulations be used to protect *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* from threats on San Clemente Island. Based on the occurrence of these taxa on federally owned land, the primary laws with potential to protect them include the National Environmental Policy Act (NEPA) and the Act. NEPA requires Federal action agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. The Navy has implemented NEPA since its enactment in 1970. Likewise, the Navy has a history of consultation and coordination with the Service under the Act regarding the effects of various San Clemente Island activities on federally listed species since taxa on the island were first listed in 1977. Finally, pursuant to the Sikes Act Improvement Act, the Navy adopted an INRMP for San Clemente Island in 2002 that helps guide the management and protection of these taxa (Navy 2002, pp. 1.1–8.12). An INRMP is a plan that is intended ''* * * to guide installation commanders in managing their natural resources in a manner that is consistent with the sustainability of those resources while

ensuring continued support of the military mission'' (Navy 2002, p. 1–1). To achieve this, the INRMP identifies goals and objectives for specified management units and their natural resources. The following objectives have been incorporated as part of the INRMP to address the Recovery Plan task of incorporating recovery actions into existing management plans:

(1) Protect, monitor, and restore plants and cryptograms (soil crusts composed of living cyanobacteria, algae, fungi, or moss) in order to manage for their long-term sustainability on the island;

(2) Consider *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* or *Castilleja grisea* as ''Management Focus Plants,'' such that they are considered independently from their plant communities as special management focuses (habitat protection alone is not assumed to be sufficient for their protection);

(3) Conduct status surveys for listed plants;

(4) Ensure that Management Focus Plants have a network of suitable sites;

(5) Perform studies to determine the pollinators of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* or *Castilleja grisea;* and

(6) Continue to apply genetic research and management approaches to rare plant management.

Through these mechanisms, the Navy is required to identify and address all threats to these species during the INRMP planning process. If possible, threats are ameliorated, eliminated, or mitigated through this procedure. The Navy has strived to fulfill this objective through both internal planning (INRMP) and through compliance with Federal law (consultations with the Service under the Act and preparing environmental review documents under NEPA). As discussed below under the five factors, the actions taken by the Navy under the INRMP have not completely eliminated all adverse impacts, but many threats have been greatly reduced. These contributions to the elimination of adverse impacts partially fulfill, but do not fully achieve, the objective for all three species.

Objective 2: Protect Known Resources From Further Degradation By: (a) Removal of Feral Herbivores, Carnivores, and Selected Exotic Plant Species; (b) Control of Unnatural Erosion in Sensitive Locations; and (c) Directing Military Operations and Adverse Recreational Uses Away From Biologically Sensitive Areas

In 1992, the Navy fulfilled a major part of this objective by removing the last of the feral goats and pigs from San Clemente Island (as described above in the *Habitat* section). Nonnative plants have also been targeted for removal from San Clemente Island, and efforts to control nonnatives have been implemented on an annual basis since approximately 1993 (O'Connor 2009a, pers. comm.). The specific nonnative plants targeted and amount of money allocated to this program are adjusted on an annual basis (O'Connor 2009b, pers. comm.; Munson 2011a, pers. comm.). The effectiveness of this program was recently improved by providing authorization to apply herbicides (O'Connor 2009b, pers. comm.). Priorities in the nonnative plant program are currently focused on new nonnatives to the island and particularly destructive nonnative species.

The Navy is also taking steps to minimize the effects of erosion on the island. Erosion control measures are being incorporated into project designs to minimize the potential to exacerbate existing erosion (O'Connor 2009c, pers. comm.). With the expansion of military operational areas, the Navy committed to prepare and implement an erosion control plan that will minimize soil erosion within and adjoining the operational areas (Navy 2008b, pp. 5–30; USFWS 2008 p. 62). However, this plan has not been finalized nor yet implemented, and it is unclear whether erosion control measures will be implemented consistently or at all in areas that are operationally closed to monitoring and access due to unexploded ordnance. The proposed erosion control plan includes development and application of best management practices (BMPs) such as: Establishing setbacks and buffers from steep slopes, drainages, and sensitive resources; constructing site-specific erosion control structures; conducting revegetation and routine maintenance; and monitoring and adjusting the BMPs as appropriate. While the erosion control plan is being prepared, the Navy has postponed all major battalion movements and training, and is using BMPs when creating and approving projects that might contribute to erosion on the island. The Navy has taken steps to reduce the threat of erosion on the island and contribute to the achievement of this objective.

The Navy is taking precautions to avoid plants when possible to minimize direct impacts to *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* resulting from military activities. For example, in the MOFMP, the Navy proposed to develop a Training Area Range (TAR) that contained *A. d.* var. *traskiae* within its boundaries. After consultation with USFWS, the Navy revised these boundaries to avoid most of the *A. d.* var. *traskiae* and minimize the impact of training on the species (USFWS 2008, p. 118).

This objective has been largely met for *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea.* Feral herbivores have been removed, erosion control measures are being implemented, and military activities are avoiding direct impacts to plants whenever possible. The Navy is also developing an erosion control plan for military activities. However, many occurrences of *Malacothamnus clementinus* are located in areas that continue to be impacted, or their status remains unknown due to closures. Therefore, Objective 2 has not been sufficiently satisfied for this taxon.

Objective 3: Restore Habitats by Revegetation of Disturbed Areas Using Native Species

Since 2001, the Navy has contracted with the San Diego State University Soil Ecology and Restoration Group (SERG) to propagate and outplant (transplant individuals from the greenhouse to vegetative communities) native species on the island (Howe 2009b, pers. comm.). The SERG propagates and outplants approximately 4,000 native plants per year, and has initiated restoration at approximately 28 sites (O'Connor 2009b, pers. comm.). This program has not included propagation and outplanting of listed plant taxa, except in one recent instance to replace *Acmispon dendroideus* var. *traskiae* plants that were extirpated during a scrap metal removal project (Munson 2011a, pers. comm.). The outplanting of native species is primarily focused on restoring sensitive island habitats and improving habitat conditions for endangered animal taxa (such as the San Clemente loggerhead shrike (*Lanius ludovicianus mearnsi*)), with some revegetation of eroded and disturbed areas (O'Connor 2009, pers. comm.). Although only one of the restoration efforts was specifically designed for the benefit of one of the three plant taxa addressed in this finding, restoration of the island's vegetation communities should help improve habitat suitability for all three taxa by reducing the spread of invasive nonnative plants and restoring ecological processes. Although progress has been made towards restoring disturbed areas, there are still areas (e.g., especially within SHOBA) that need further restoration of native species. Therefore, while restoration is occurring, the objective has not been

fully met at this time for the three species.

Objective 4: Identify Areas of San Clemente Island Where Habitat Restoration and Population Increase of Certain Addressed Taxa May be Achieved Through a Careful Survey of the Island and Research on Habitat Requirements of Each Taxon

Since they were listed, a number of studies have addressed the ecology, taxonomy, and genetics of the three plant taxa. Evans and Bohn (1987, pp. 537–545) observed insects on plants, collected seeds, and studied the germination of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea.* Junak and Wilken (1998, pp. 1–426) studied flowering and fruiting in natural populations and performed germination trials with collected seeds from all three taxa. Allan (1999, pp. 46–105) observed pollinators and germinated seeds collected from *A. d.* var. *traskiae.* Liston *et al.* (1990) confirmed suspected hybridization between *A. d.* var. *traskiae* and *A. argophyllus* var. *argenteus* using genetic techniques. Additionally, Allan (1999, pp. 46–105) surveyed the genetics of a number of taxa within the genus *Lotus,* including a group that includes *A. d.* var. *traskiae,* to compare genetic divergence between California mainland and island taxa. Helenurm *et al.* (2005, pp. 1221–1227) studied patterns of genetic variation among occurrences of *C. grisea.* Helenurm (1997, pp. 41–51; 1999, pp. 29–40) studied the genetic variation and clonal nature of *M. clementinus.* These studies have helped to elucidate potential plant pollinators and mating systems, plant propagation techniques, and to design management strategies that take into consideration genetic factors. There is a growing body of knowledge on the habitat requirements and life history of listed species on the island. This research, encouraged and supported by the Navy, has contributed to achieving Objective 4 and to planning successful restoration of habitat and recovery of the three taxa. Additional surveys and research necessary to identify appropriate restoration, management, and recovery actions include: further genetic studies for *M. clementinus,* research on the degree of hybridization in *A. d.* var. *traskiae* and study of the host plants of *C. grisea.* Thus, this objective has not been fully achieved at this time for the three species.

Objective 5: Delist or Upgrade the Listing Status of Those Taxa That Achieve Vigorous, Self-Sustaining Population Levels as the Result of Habitat Stabilization, Restoration, and Preventing or Minimizing Adverse Human-Related Impacts

The distributions of *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* have increased substantially over much of the island since listing. There are now vigorous, self-sustaining occurrences of *A. d.* var. *traskiae* and *C. grisea* on San Clemente Island, as described above. Threats to these taxa have also been reduced to levels such that they are no longer in danger of extinction throughout all of their range (USFWS 2007b, pp. 1–22; USFWS 2007c, pp. 1–19). Although the goal of delisting has not yet been met, the objective to improve the status of *A. d.* var. *traskiae* and *C. grisea* to the point they can be reclassified has been met. Because many occurrences of *Malacothamnus clementinus* are located in areas that continue to be impacted, or their status remains unknown due to closures, we have not yet met either standard of this objective to reclassify or delist this species.

Objective 6: Monitor Effectiveness of Recovery Efforts by Undertaking Baseline Quantitative Studies and Subsequent Follow Up Work

To evaluate the success of management actions undertaken to benefit the three plant taxa, the Navy implemented a long-term vegetation monitoring study (Tierra Data Inc. 2005, pp. i–96 and Appendices) and commissioned sensitive plant surveys (Junak and Wilken 1998, pp. 1–416; Junak 2006, pp. 1–176). Overall, vegetation trend monitoring reveals that the cover of both native and nonnative plant species has changed since the removal of feral goats and pigs, but the response of individual species and vegetative communities has varied, with some species and communities exhibiting greater changes than others. Discerning long-term vegetative community trends is difficult because the vegetative community study was preceded by a wet year that likely had a strong influence on the data collected (Tierra Data Inc. 2005, p. 29). Within the few monitoring plots that included the three plant taxa, occurrence counts varied among years and did not provide a clear indication of trend (Tierra Data Inc. 2005, pp. 79–80). The clearest indication of the success of feral animal removals for the three plant taxa was obtained from rare plant survey data (Junak and Wilken 1998, pp. 1–416, GIS data; Junak 2006, pp. 1–176, GIS data; Tierra Data Inc. 2008, pp. 1–24, appendices and GIS data; SERG 2009–2011, GIS data). These surveys have added substantially to the number of documented occurrences of each of the three taxa.

Rare plant surveys and island flora studies have documented many more locations occupied by *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* than were known at the time of listing. Since listing, 8 additional occurrences of *M. clementinus,* 23 occurrences of *A. d.* var. *traskiae,* and 10 occurrences of *C. grisea* have been documented (Table 1). It is unknown whether the higher number of occurrences represents detections due to increased survey efforts, recruitment from the seed bank, or recolonization by the plants as a result of management actions implemented by the Navy to conserve listed species on the island (see *Distribution* section for each taxon above). However, this improvement in the documented status of each of these taxa suggests that feral goats and pigs were a significant threat to each. Thus, their improved status may largely be due to the implementation of a single action identified in the Recovery Plan. Because portions of the island remain closed, monitoring effectiveness of recovery efforts is not being fully implemented. Occurrences for each species, as described above, are closed to access for monitoring or any recovery efforts. Thus, Objective 6 cannot be fully met for the three taxa under current operational closure directives.

Summary of Recovery Plan Implementation

In summary, while the Recovery Plan does not include taxon-specific downlisting or delisting criteria for measuring the recovery of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea,* many of the actions identified in the Recovery Plan have been implemented to benefit these taxa. Most significantly, the Navy removed feral goats and pigs from San Clemente Island in 1992. The improvement in the documented status of each of these listed plant taxa suggests that the removal of these animals was integral to their ability to establish vigorous, self-sustaining occurrences. Though the distribution of *Malacothamnus clementinus* has continued to increase on the island, the majority of its range occurs within SHOBA. Since access to Impact Areas within SHOBA is restricted to military personnel, the status of three *M. clementinus*

occurrences is uncertain at this time. A fourth occurrence, with a significant amount of genetic diversity, outside of the impact areas is also closed at this time. Due to limited access to these areas, there are insufficient data to indicate that the objectives have been successfully met. In addition, limited access precludes natural resource managers from implementing management actions, such as nonnative control and fire suppression.

In contrast, threats are reduced in areas occupied by *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea,* and many of the objectives have been met in part or full. Complementing the success of these conservation measures, the ecology and genetics of each of these taxa have been studied, and a number of programs are now in place to improve habitat suitability, prevent introductions of nonnative species, guide and track management efforts, and protect occurrences of these plant taxa. We investigated other potential threats for these taxa and concluded that they do not pose significant impacts. Based on our review of the Recovery Plan, we conclude that the status of *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* has improved due to activities being implemented by the Navy on San Clemente Island. The effects of these activities on the status of the three taxa are discussed in further detail below.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth procedures for listing species, reclassifying species, or removing species from the Federal Lists of Endangered and Threatened Wildlife and Plants. ''Species'' is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). Once the ''species'' is determined, we then evaluate whether that species may be endangered or threatened because of one or more of the five factors described in section 4(a)(1) of the Act. Those factors are:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

We must consider these same five factors in reclassifying or delisting a species. Listing, reclassifying, or delisting may be warranted based on any of the above threat factors, either singly or in combination. For species that are already listed as threatened or endangered, an analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting or downlisting.

Under section 3 of the Act, a species is ''endangered'' if it is in danger of extinction throughout all or a significant portion of its range, and is ''threatened'' if it is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. The word ''range'' refers to the range in which the species currently exists, and the word ''significant'' refers to the value of that portion of the range being considered to the conservation of the species. The ''foreseeable future'' is the period of time over which events or effects reasonably can or should be anticipated, or trends extrapolated.

We considered and evaluated the best available scientific and commercial information for this analysis. Information pertaining to *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* in relation to the five factors provided in section 4(a)(1) of the Act is discussed below. For the purposes of this analysis, we will first evaluate whether the currently listed species should be considered threatened or endangered throughout all their ranges. If we determine that the species are threatened, then we will consider whether there are any significant portions of their ranges where they are in danger of extinction or likely to become endangered within the foreseeable future. The five factors listed under section 4(a)(1) of the Act and their applications to *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* are presented below.

Malacothamnus clementinus (San Clemente Island Bush Mallow)

In the 2007 status review, we acknowledged that the predominant threat at listing (grazing from feral herbivores) was ameliorated with the removal of goats and pigs from the island in 1992 (USFWS 2007a, pp. 1–28). Threats to *Malacothamnus clementinus* identified in 2007 included: (1) Land use, (2) fire, (3) nonnative species, (4) erosion, (5) natural factors, (6) fire management, and (7) limited access to SHOBA. Land use, fire, nonnatives, erosion, and fire management are discussed as habitat threats below under *Factor A.* Natural factors in the 2007 status review refer to the low genetic diversity of this taxon and are discussed in *Factor E* below. In 2007, access to SHOBA was described as a threat because it ''undermines the effectiveness of surveys and management efforts'' (USFWS 2007a, p. 21). While lack of access to portions of the island still limits our ability to assess the status of the taxon, access to SHOBA is not considered a threat. Rather, the lack of access contributes to uncertainty in assessing threats and the species' response to those threats and to actions taken to ameliorate threats. In this finding, we focus on threats responsible for impacting the listed entity or habitat where it occurs, not our inability to access these areas.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The final listing rule (42 FR 40682; August 11, 1977) identified the following threats to *Malacothamnus clementinus:* Habitat alteration and destruction, competition from nonnative species, and direct predation by nonnative herbivores (goats and pigs). With the final removal of these herbivores in 1992, the vegetation on San Clemente Island has rebounded, and the status of many rare plant occurrences, including *M. clementinus,* has improved (Tierra Data Inc. 2005, p. 8; Junak 2006a, pers. comm.). Although the direct threat from predation to *M. clementinus* identified in the final listing rule has been eliminated, erosion as a result of overgrazing and invasive nonnative plants remain ongoing threats to habitat of *M. clementinus.* The Recovery Plan also identified habitat alteration and disturbance from the Navy's use of the island for military operational and training needs as additional threats to the habitats occupied by *M. clementinus* (USFWS 1984, pp. 58–63). Additional threats identified since listing include alteration of San Clemente Island habitats by military training activities, fire, and fire management. As outlined below, we discuss in this section the impacts of the following threats that affect the habitat or range of *M. clementinus:* (1) Land use, (2) erosion, (3) nonnative plants, (4) fire, and (5) fire management.

Land Use

In this section we describe threats considered likely based on land use designations. A total of 11 *Malacothamnus clementinus* occurrences are distributed on San

Clemente Island, including one mid-island (Lemon Tank Canyon) and the remaining 10 approximately 9.5 mi (15.3 km) along the southwesterly facing coastal terraces at the southern end of the island. Historically, the island was used for grazing and ranching. At the time of listing, the Navy had acquired the island, although military operations were not intense and feral grazers were still on the island. Since listing, training activities and land use by the Navy have increased significantly. Since it was first listed in 1977, the Navy has consulted and coordinated with us regarding the effects of various activities on *M. clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* (USFWS 2002, pp. 1–21; USFWS 2003, p. 1; USFWS 2004, pp. 1–2; USFWS 2008, pp. 1–237). These consultations have addressed numerous activities including training, fire management, the installation of wind turbines, missile tests, maintenance and construction of Ridge Road and the assault vehicle maneuver route, construction of berthing buildings, and development and use of training areas.

Most recently, training activities approved in the MOFMP include substantial increases in vehicle and foot traffic in the IOA (Navy 2008b, pp. 2–1 to 2–52). In November 2008, we completed a biological opinion describing the impact of the Navy's military training program proposed in the MOFMP on 11 federally listed species on San Clemente Island, including the three taxa that are the subject of this finding (USFWS 2008, pp. 1–237). This consultation addressed the proposed expansion of the frequency and amount of military training on the island, along with enhanced training complex capabilities, construction of new gates and buildings, use of an IOA, change in fire management strategies, and use of an assault vehicle maneuver corridor. Examples of projected increases in training levels relative to a representative year of training prior to 2008 include: 11 percent increase in naval fire support exercises, 23 percent increase in land bombing exercises, 150 percent increase in explosive ordnance disposal, 60 percent increase in artillery operations, 90 percent increase in land demolitions, 19 percent increase in land navigation exercises, and 96 percent increase in SEAL platoon operations (USFWS 2008, p. 11).

We considered the status and distribution of *Malacothamnus clementinus,* and the various management, avoidance, and minimization measures in place, including those the Navy will implement with the new MOFMP in our 2008 biological opinion (we also considered impacts to *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea*). Additionally, the Service made conservation recommendations within the biological opinion, including: (1) Considering recommended actions from the 5-year review in the upcoming revision of the INRMP, (2) propagation and outplanting of narrowly distributed, listed plant species, and (3) the collection of *M. clementinus* cuttings and seeds from Horse Beach Canyon for the propagation and outplanting of individuals in areas without military training. We concluded that ongoing and likely impacts from the proposed increases in military training activities would not jeopardize the continued existence of *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* (USFWS 2008, p. 90).

The southern portion of the distribution of *Malacothamnus clementinus* spans the boundary of SHOBA, which supports a variety of training operations involving both live and inert munitions fire. The majority of this area serves as a buffer for areas of more intense training and is less susceptible to direct land use threats than occurrences within TAR, IOA, or Impact Areas. Six of 11 known occurrences (54 percent; Canchalagua Canyon, Horse Beach Canyon, Lower China Canyon, Upper China Canyon, Cave Canyon, and Chukit Canyon) fall within SHOBA, where diffuse or accidental impacts to *M. clementinus* are likely to occur, and training might result in the alteration of habitat by Off Highway Vehicle (OHV) movement and large-scale troop movements through the military impact and training areas. Within the Impact Areas, some munitions exercises involve the use of incendiary devices, such as illumination rounds, white phosphorous, and tracer rounds, which pose a high risk of fire ignition (USFWS 2008, pp. 11–13). One occurrence (Lower China Canyon) is within the IOA, and could experience direct impacts from troop and vehicle movement through the area. Three additional occurrences (Upper China Canyon, Horse Beach Canyon, and Lemon Tank Canyon) are near the IOA (within 1,000 ft (305 m)), and could be subjected to diffuse or accidental impacts. Because of the elevated risk of fire and disturbance associated with training activities, live and inert munitions fire are targeted towards two delineated Impact Areas (I and II) within SHOBA where bombardments and land demolition are concentrated. Three of 11 occurrences (27 percent; Upper China Canyon, Lower China Canyon, and Horse Beach Canyon) are within Impact Areas I or II, and are now closed to nonmilitary personnel (USFWS 2008, p. 50).

As a result, it is not possible to assess the magnitude of the threat in these areas, and the status of the three occurrences remains unknown. These occurrences, although limited in number, contain the greatest numbers of individuals and some of the highest genetic diversity on the island (Helenurm 1999, p. 40). The intense training activities within the Impact Areas pose a direct threat to habitat and occurrences due to associated ground disturbance and bombardment (USFWS 2008, pp. 83–84). The majority (8 of 11) of *Malacothamnus clementinus* occurrences are located outside of any training areas (IOA, TAR, or Impact Area) and are less likely to sustain direct impacts from military activities associated with land use; three occurrences (Upper China Canyon, Lower China Canyon, and Horse Beach Canyon) are partially or wholly within the boundaries of a training area (IOA, TAR, or Impact Area).

The Lemon Tank Canyon occurrence falls within an area identified by the INRMP as needing environmental cleanup pursuant to the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (Navy 2002, p. 2–18). This site is still in the study phase and has not been listed, or proposed for listing, on the National Priorities List. Habitat at this occurrence could receive improvements by future environmental cleanup (Munson 2011b, pers. comm.). Initial surveys of the project footprint have been completed, and *Malacothamnus clementinus* was not found in the project footprint (B. Munson 2011e, pers. comm.), although additional surveys will need to be undertaken to ensure there is no impact to the plant. RCRA and CERCLA require that impacts to the species and its habitat be avoided and minimized to the extent practicable. This area has also been closed to natural resource personnel, and the status of the occurrence in this area is unknown (Munson 2011c, pers. comm.).

While the increase in military training affects the species (as well as *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea*), the Navy through implementation of the INMRP is avoiding and minimizing the impacts to the extent practicable while meeting operational needs. Land use is currently impacting habitat of 4 of the 11 occurrences (36 percent; Lemon Tank

Canyon, Lower China Canyon, Upper China Canyon, and Horse Beach Canyon) on the island, which may lead to overall habitat degradation, and cause the loss of individuals or groupings of plants in a given area. Military operations and training are island-wide threats to *M. clementinus,* particularly to the occurrences in or adjacent to military training areas.

Erosion

Erosion and associated soil loss caused by browsing of feral goats and rooting of feral pigs likely modified the island's habitat (Navy 2002, p. 1–14). Defoliation from overgrazing on San Clemente Island increased erosion over much of the island, especially on steep slopes where denuded soils can quickly wash away during storm events (Johnson 1980, p. 107; Navy 2002, pp. 1–14, 3–9; Tierra Data Inc. 2007, pp. 6–7). In the INRMP, erosion was identified as a threat to canyon woodland and maritime desert scrub vegetation communities, which is *Malacothamnus clementinus* habitat (Navy 2002, pp. 4–3, 4–12). In the southwestern portion of its distribution, *M. clementinus* is found along coastal terraces, canyon rims, and at the base of escarpments where erosion is more prevalent. The erosion process can remove soil that provides nutrients and physical support for the plants, displace seeds and deposit them in unsuitable locations, and bury extant individuals or small occurrences of the plants. This stripping of soil and plants can affect vegetation composition and landscape long after the herbivores are removed (Johnson 1980, p. 107). Erosion has likely been exacerbated by reductions in vegetation cover due to drought and fire (Johnson 1980, pp. 105–118). Currently, the Navy has a program run by SERG that grows and outplants native vegetation to areas that need to be restored (Navy 2002, pp. 3–51 to 3–52). Restoration of native vegetation helps retain soil and ameliorate erosion in stripped areas.

Increased military activities, especially where *Malacothamnus clementinus* is found within training area boundaries, cause erosion through soil compaction or other soil disturbances in occupied habitat near roadways or vehicle maneuver areas (Tierra Data Inc. 2007, p. 12). With the exception of the main road, the roads on San Clemente Island are largely unpaved, and 5 of the 11 occurrences (45 percent; Lower China Canyon, Horse Beach Canyon, Middle Ranch Canyon, Waymuck Canyon, and Lemon Tank Canyon) are within 500 ft (152 m)) of a road on the island (Forman and Alexander 1998, p. 217). These occurrences could be subject to diffuse disturbance (spread out over a large area or not concentrated) and road effects that degrade habitat quality. Roads can concentrate water flow, causing incised channels and eroded slopes (Forman and Alexander 1998, pp. 216–217). This increased erosion around roads can degrade habitat, especially along steep canyons and ridges. Erosion impacts are likely greatest in SHOBA, where bombardment has led to a pattern of surface disturbance and recurrent fire (Navy 2002, pp. 3–5). The Navy studied the potential for erosion from several proposed military activities (Tierra Data Inc. 2007, pp. 1–45, Appendices). One additional occurrence at Upper China Canyon is also impacted by erosion. Therefore, 6 of the 11 occurrences (54 percent; Lower China Canyon, Upper China Canyon, Horse Beach Canyon, Middle Ranch Canyon, Waymuck Canyon, and Lemon Tank Canyon) of *M. clementinus* are likely to be further impacted by erosion (Table 1).

Erosion control measures are incorporated into all site feasibility studies and project planning, design, and construction to minimize the potential to exacerbate existing erosion and avoid impacts to listed species (Munson 2011a, pers. comm.). The INRMP requires that all projects include erosion conservation work and associated funding (Navy 2002, p. 4–89). These conservation actions include best management practices for construction and engineering, choosing sites that are capable of sustaining disturbance with minimum soil erosion, and stabilizing disturbed sites with native plants (Navy 2002, pp. 4–89–4–91). Additionally, large-scale island-wide maneuvers with assault vehicles have been postponed until an erosion control plan is drafted and implemented. Due to potential new training in the IOA and the Assault Vehicle Maneuver Area (AVMA), an erosion control plan to minimize the effects of the potential training is currently being developed for San Clemente Island (Munson 2011a, pers. comm.). The Navy has committed to preparing this plan and implementing it prior to any new training or operations in the IOA or AVMA (Navy 2008b, pp. 5–29, 5–30). The proposed erosion control plan includes development and application of BMPs including: establishing setbacks and buffers from steep slopes, drainages, and sensitive resources; constructing site-specific erosion control structures; conducting revegetation and routine maintenance; and monitoring and adjusting the BMPs as appropriate. Implementation of the erosion control plan is expected to prevent soil erosion from adversely affecting federally listed species, including *Malacothamnus clementinus,* and their habitats. Additionally, the plan is designed to prevent soil erosion from significantly impacting other sensitive resources, including sensitive plant and wildlife species and their habitats. This erosion control plan will address military operations associated with the IOA, AVMA, and AFP; however, since the plan is not yet finalized, it does not currently ameliorate the noted threats from erosion.

The processes and results of erosion are island-wide threats to the habitat of *Malacothamnus clementinus,* particularly to the occurrences in or adjacent to military training areas or roads. Erosion is currently impacting 6 of the 11 occurrences (54 percent) on the island, which may lead to overall habitat degradation, and cause the loss of individuals or groupings of plants in a given area. Of the six occurrences currently impacted by erosion, four (Lower China Canyon, Upper China Canyon, Horse Beach Canyon, and Lemon Tank Canyon) are in areas that are operationally closed to access, and likely not afforded conservation measures to control or monitor erosion. With these closures and continued impacts, erosion remains a threat to the habitat of *M. clementinus.*

Nonnative Species

One of the threats to *Malacothamnus clementinus* identified in the final listing rule was the spread of nonnative plants into its habitat (42 FR 40682; August 11, 1977). Nonnatives can alter habitat structure, ecological processes (such as fire regimes), nutrient cycling, hydrology, and energy budgets and compete for water, space, light, and nutrients (Zink *et al.* 1995, p. 307; Brooks 1999, pp. 16–17; Mack *et al.* 2000, p. 689). By 1992, researchers had documented 99 nonnative plant species on San Clemente Island (Kellogg and Kellogg 1994, p. 5), and transfer of nonnative species to the island continues to be a problem today (Dunn 2006, pers. comm.; Junak 2006c, pers. comm.; Kellogg 2006, pers. comm.; O'Connor 2009c, pers. comm.). Nonnative species of particular concern include *Foeniculum vulgare* (fennel) and *Brassica tournefortii* (Sahara mustard), which have already invaded *M. clementinus* habitat. Since nonnative herbivores were removed from the island, the most significant structural alteration to the habitat has been the proliferation of nonnative annual grasses, such as *Avena* spp. (oats), *Bromus* spp. (bromes), and *Vulpia*

myuros (annual fescue). Annual grasses vary in abundance with rainfall, potentially changing the vegetative community from shrubs to grasses, and may increase the fuel load in wet years (see *Factor A—Fire* section below). Nonnative grasses are present in the native maritime desert scrub vegetation community where *M. clementinus* is often found (Tierra Data Inc. 2005, pp. 36–42).

Although previous invasions of nonnatives probably were introduced in grazing fodder, current invasions are typically introduced by military activities and training on the island. Nonnative plants likely come in with equipment, vehicles, material, and personnel, and are spread by their movements. The primary pathway and vector for nonnative species into arid and semi-arid ecosystems are vehicles and vehicular routes, and disturbances along these routes and corridors enable their establishment (Stylinski and Allen 1999, p. 551; Gelbard and Belnap 2003, pp. 424–425; Von der Lippe and Kowarik 2007, p. 986). Island ecosystems and species are especially vulnerable to nonnative plant invasions due to the relative lack of biotic diversity and natural predators (Mack and Lonsdale 2002, p. 164).

Nonnative plants constitute a rangewide threat to the endemic plant community and habitat on San Clemente Island, including the habitat of all occurrences of *Malacothamnus clementinus.* Five of 11 occurrences (45 percent; Lower China Canyon, Horse Beach Canyon, Middle Ranch Canyon, Waymuck Canyon, and Lemon Tank Canyon) are within 500 ft (152 m) of Ridge Road or China Point Road, and may be subject to diffuse disturbance and road effects that degrade habitat quality along the road (Forman and Alexander 1998, p. 217). Roadsides tend to cultivate conditions (high disturbance, seed dispersal by vehicles, ample light, and water runoff) favorable to nonnative species (Forman and Alexander 1998, p. 210). Nonnatives, including *Foeniculum vulgare* and *Mesembryanthemum crystallinum* (crystalline iceplant), have been found in the disturbed shoulders along the road between Ridge Road and China Point in SHOBA (Braswell 2011, pers. obs.).

Potential impacts from nonnative plants to the habitats of the three taxa analyzed in this finding are minimized through annual implementation of the Navy's island-wide nonnative plant control program (O'Connor 2009b, pers. comm.; Munson 2011a, pers. comm.). The focus of the nonnative plant species program is to control plants on the island with the potential to adversely impact habitat of federally listed species, which includes the eradication of isolated occurrences of nonnatives and early detection and eradication of new nonnative species (Navy 2008b, p. 5–28). This program targets nonnative species for elimination using herbicide and mechanical removal, with priorities currently focused on new invasions and particularly destructive nonnative species. Nonnative species management targets are identified and prioritized annually by Navy natural resource managers (Munson 2011a, pers. comm.). These tactics have been successful in isolating and limiting some species, such as *Foeniculum vulgare,* to a few locations (Howe 2011b, pers. comm.). To reduce the potential for transport of nonnative plants to San Clemente Island, military and nonmilitary personnel inspect tactical ground vehicles and remove any visible plant material, dirt, or mud on them prior to going to San Clemente Island (USFWS 2008, p. 63). This cleaning helps prevent nonnative plants from reaching the island, but once there, nonnative plants are easily spread from one area to another by the movement of vehicles.

The Navy has implemented preventative and control programs for the nonnative plant species on the island. Although nonnatives will continue to pose a rangewide risk to the habitat of *Malacothamnus clementinus,* the Navy has taken steps to curtail habitat conversion by nonnative plants. Management and control of nonnative plants is not in place at the four occurrences that are closed to natural resource managers. However, outside of these areas, *M. clementinus* has persisted on the island and, despite the continued risk of encroachment by nonnatives, its range has continued to expand. Nonnatives remain a threat to the *M. clementinus'* habitat, particularly in the four occurrences that are closed to monitoring and management efforts.

Fire

Fire was not considered a threat to *Malacothamnus clementinus* at the time of listing (42 FR 40682; August 11, 1977). Since that time, however, over 50 percent of the island has experienced at least one wildfire (Navy 2002, Map 3–3, p. 3–32), and some areas have burned multiple times with short intervals between fires (Navy 2002, Map 3–4, p. 3–33). Between 1990 and 2004, there were 114 wildfires on the island suspected to be from Navy operational sources (Navy 2008a, pp. 5–18, 5–19). The majority of fires are concentrated in SHOBA, and potentially impact the habitat of 6 of 11 (54 percent) of *M. clementinus* occurrences (Canchalagua Canyon, Horse Beach Canyon, Lower China Canyon, Upper China Canyon, Cave Canyon, and Chukit Canyon). Three of these occurrences (Upper China Canyon, Lower China Canyon, and Horse Beach Canyon) are in Impact Areas I and II, where the risk of frequent fire (less than 5 years apart) is especially high (Navy 2002, pp. 5–93, 5–99). The effects of fire on habitat within the Impact Areas are currently unknown due to closure to natural resource personnel (USFWS 2008, p. 50).

The remaining land in SHOBA acts as a buffer from fires and munitions between the Impact Areas and the rest of the island. Fires are occasionally ignited by activities north of SHOBA, posing a low-magnitude threat to the remaining five occurrences (Lemon Tank Canyon, Box Canyon, Norton Canyon, Middle Ranch Canyon, and Waymuck Canyon) (Navy 2002, Map 3–4, p. 3–33). Due to the potential for unexploded ordnance within SHOBA, unless a fire threatens human life or facilities, it usually is allowed to burn itself out (Navy 2002, p. 3–32; Kellogg 2006, pers. comm.). This contrasts with the northern portion of the island where wildfires are usually suppressed (Kellogg 2006, pers. comm.).

Increased fire frequency (more than every 5 years) from intensified military use could lead to localized changes in vegetation. Nonnative annual grasses can increase fuel load for fire ignition and spread within the landscape. Dried grasses provide a fuel that is easily ignitable, and can extend the fire season by more than a month because they desiccate sooner than the native herbaceous flora. These grasses can also colonize a burned area better and more quickly than native species, thereby creating a cycle where fire and nonnatives are positive feedbacks for one another (Brooks *et al.* 2004, p. 677). Frequent fires within and adjoining military training areas have the potential to alter the vegetative community, resulting in the conversion of shrublands to nonnative grasslands, and a reduction in native perennial bunchgrasses (O'Leary and Westman 1988, p. 779; D'Antonio and Vitousek 1992, p. 73; Minnich and Dezzani 1998, pp. 383–384; Keeley *et al.* 2005, p. 2109; Tierra Data Inc. 2005, p. 88).

At the time of listing, fire was not identified as a threat because of lack of fire history and the low intensity of military training on the island. Since that time, military training has significantly increased, and we have better records of the fire frequency on the island. Fire is a rangewide threat to the habitat of *M. clementinus,* and 6 of

the 11 occurrences (54 percent) of *Malacothamnus clementinus* occur within areas that may be subject to recurrent fire associated with military training (Table 1; Canchalagua Canyon, Horse Beach Canyon, Lower China Canyon, Upper China Canyon, Cave Canyon, and Chukit Canyon). The remaining five occurrences are in habitat with a lower risk of recurrent fire and are less likely to experience changes in vegetation community due to fire. It is unlikely that fire control or prevention measures will be undertaken in the habitat at the three occurrences within the Impact Areas that are operationally closed. Fires that escape designated training areas may threaten other parts of the island, though because of its broad distribution, it is unlikely that one fire would be capable of spreading throughout the entire range of *M. clementinus.* The Navy's implementation of the MOFMP will limit the frequency of fires that escape Impact Areas. Through the annual review process, the Navy identifies mechanisms to reduce fire return intervals in areas where this taxon is concentrated (USFWS 2008, pp. 91–122).

The Navy has implemented preventative and control programs for fire on the island. Although fire will continue to pose a rangewide risk to the habitat of *Malacothamnus clementinus,* the Navy has taken steps to curtail habitat conversion by frequent and intense fire. Six of the 11 occurrences (54 percent) of *M. clementinus* occur within areas that may be subject to recurrent fire associated with military training. Management and control of fire is not in place at the three occurrences that are closed to natural resource managers. However, *M. clementinus* has persisted on the island and, despite the continued risk of fire, its range has continued to expand. Fire remains a threat to the *M. clementinus'* habitat, particularly in the three occurrences in the impact areas that are closed to monitoring and management efforts.

Fire Management

In 2008, the Service issued a biological opinion to the Navy on its MOFMP on San Clemente Island (USFWS 2008, pp. 1–244). The biological opinion addressed impacts to all 11 currently listed terrestrial taxa known to occur on San Clemente Island, including the three taxa analyzed in this finding. Military activities contribute to fires on San Clemente Island that may adversely affect listed plants and wildlife (USFWS 2008, p. 3). The Navy's focus on fire management is related to military training and other human-related activities and facilities, as these activities represent the primary source of ignition on the island (USFWS 2008, p. 3). Seasonal range and training modifications, based on weather patterns and moisture, are efforts taken by the Navy to assist in the prevention of fire ignition, containment, and fire suppression (USFWS 2008, pp. 3–4).

In response to the potential hazard of wildfires on San Clemente Island, firefighting techniques have improved for known operational-related ignition sources (Navy 2008b, pp. 3.11–71). Within the MOFMP, the Navy proposed the expansion of military training, as well as the implementation of a fire management plan directed at fire suppression, fire prevention, and fuels management. This plan was developed to provide flexibility for the timing of military training, and will modify the level of fire suppression resources required to be present during training activities. Real-time weather data and fuels management, in combination with the ready availability of fire suppression resources, are used to minimize the risk of fires spreading from areas approved for the use of ordnance and incendiary devices. The Navy has committed to conducting an annual review of fire management and fire occurrences that will allow for adaptive management and changes in the MOFMP (USFWS 2008, pp. 91–122).

The MOFMP was developed by the Navy to provide flexibility for the timing of military training, and to ensure that elevated fire suppression resources were present to address an increased level of training activities and fire risk. In response to the potential hazard of wildland fires on San Clemente Island, firefighting techniques have improved for known operational-related ignition sources (Navy 2008b, pp. 3.11–71). The MOFMP defines the conditions under which certain fire protection resources must be available and ready for use (for example, a dedicated fire helicopter) (USFWS 2008, p. 53). The MOFMP calls for the use of real-time weather and fire forecasting to determine when certain munitions may be used and when helicopters must be present. After extensive consultation with the Navy, we issued a biological opinion on the MOFMP that concluded the MOFMP would not jeopardize the continued existence of listed species, including the three taxa analyzed in this Finding (USFWS 2008, pp. 1–237). While the increase in military training and fire suppression could affect habitat of *Malacothamnus clementinus* (as well as *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea*), we have worked with the Navy to avoid and minimize the impacts to habitat of individuals or occurrences to the extent practicable while meeting the operational needs of the Navy.

Fire suppression activities described in the MOFMP and used by the Navy include creating firebreaks (bare soil created through manual or herbicide removal of vegetation), use of fire retardants (spraying of fire retardants along fire breaks) and aerial drops of saltwater from aircraft. Fire management on San Clemente Island includes the creation of fuelbreaks within areas of SHOBA that impact the habitat at three *Malacothamnus clementinus* occurrences (Horse Beach Canyon, Lower China Canyon, and Upper China Canyon) (USFWS 2008, p. 57). Fuelbreaks are maintained along the boundaries of Impact Areas I and II to prevent the spread of fire outside of the areas (USFWS 2008, p. 57). Fuelbreaks on the island are created using herbicides and strip burning, and maintained using herbicides and fire retardant (Phos-Chek D75F) (USFWS 2008, pp. 97–98). The use of fire retardant or herbicide, as proposed in the MOFMP, results in the loss of *M. clementinus* and *Castilleja grisea* habitat within the fuelbreak footprint (USFWS 2008, p. 81). The use of Phos-Chek may also allow or facilitate the expansion and persistence of nonnative species due to the fertilizing effect of this retardant (Larson *et al.* 1999, p. 115; Kalabokidis 2000, p. 130). Fire retardants act as a source of nitrogen and phosphorous, which are nutrients that can affect plant species composition (Larson and Duncan 1982, p. 702). The Navy has begun a study on the effects of Phos-Chek on San Clemente Island vegetation, and has avoided application of Phos-Chek within 300 ft (91.4 m) of mapped listed species (including *M. clementinus* and *C. grisea*) to the extent allowable with fuelbreak installation (USFWS 2008, pp. 97–98).

It is anticipated that the Navy will construct fuelbreaks to minimize the risk of fire spreading from areas of live fire and demolition training north of SHOBA (USFWS 2008, p. 98). In the MOFMP, the Navy agreed to conduct preseason briefings for firefighting personnel on the guidelines for fire suppression, and the limitations associated with the use of Phos-Chek and saltwater drops (USFWS 2008, pp. 97–98). The impact of saltwater on the habitat of *M. clementinus* (and *Castilleja grisea*) has not yet been assessed. However, if salt persists, the composition of the plant community could change to favor more salt-tolerant taxa. Fire management could have a

direct impact on the habitat and species composition of at least three occurrences of *M. clementinus.*

The Navy's implementation of a MOFMP will help to reduce the risk of habitat conversion by fire, though the habitat of *Malacothamnus clementinus* could be altered by the management of fire. Although the threat is ameliorated through implementation of the MOFMP, fire management remains a threat to *M. clementinus,* particularly to the three occurrences that fall within areas that may be managed using fuel breaks and fire suppression.

Summary of Factor A

From 1850 until 1934, San Clemente Island was used for sheep ranching, cattle ranching, goat grazing, and pig farming (Navy 2002, pp. 3–4). The effects of these grazers, which were not completely removed from the island until 1992, on the habitat and plants were one of the original reasons for classifying *Malacothamnus clementinus* as endangered in the 1977 listing rule (42 FR 40682); this threat is now eliminated. Currently, *M. clementinus* is threatened by the destruction and modification of habitat caused by impacts related to designated land use, erosion, the spread of nonnative plants, fire, and fire management practices. To help ameliorate these threats, the Navy is implementing a MOFMP and the island-wide control of nonnative plants as outlined in the INRMP (Navy 2002, pp. 3–114–3–116; USFWS 2008, pp. 1–237). The fire management plan within the MOFMP has been used to inform strategic decisions for training using live fire or incendiary devices. Three occurrences within the Impact Areas are now closed to natural resource monitoring and management, and currently their status is unknown; a fourth occurrence (Lemon Tank) is also closed but is not within the Impact Areas.

Per our 2008 biological opinion, the Navy has postponed major troop and assault vehicle maneuvers across the island until it completes and implements an erosion control plan (USFWS 2008, pp. 62, 87). Natural resource managers have been successful at decreasing the prevalence of particularly destructive nonnatives, such as *Foeniculum vulgare.* Management actions directed at conservation of *Malacothamnus clementinus* may not be fully implemented at 4 of the 11 known occurrences (Lower China Canyon, Upper China Canyon, Horse Beach Canyon, and Lemon Tank Canyon) currently closed to natural resource access. This will reduce and fragment the effectiveness of the conservation measures. Although the species is expanding, and ongoing and anticipated conservation efforts contribute to its conservation, military training activities, erosion, nonnatives, and fire have ongoing impacts to all *M. clementinus* occurrences rangewide both now and into the future.

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

In the listing rule (42 FR 40682; August 11, 1977), the Service did not identify any threats from overutilization, and there is no new information to indicate that overutilization is a threat to *Malacothamnus clementinus.* Although herbarium specimens of *M. clementinus* and seeds have been collected for research and seed banking, overutilization of *M. clementinus* for any purpose is not currently considered a threat nor is expected to be in the future.

Factor C. Disease or Predation

Grazing of feral goats and the rooting of feral pigs was considered a threat under this category to *Malacothamnus clementinus* in the final listing rule (42 FR 40682, at 40684; August 11, 1977). This threat was ameliorated by the removal of the goats and pigs from San Clemente Island in 1992, as recognized in our 2007 status review (USFWS 2007a, p. 16). Currently, no other predators or diseases on San Clemente Island are known to pose a significant threat to *M. clementinus,* nor are they expected to in the future.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The Act requires us to examine the adequacy of existing regulatory mechanisms with respect to those existing and foreseeable threats that may affect *Malacothamnus clementinus.* The inadequacy of existing regulatory mechanisms was not indicated as a threat to *M. clementinus* at listing (42 FR 40682; August 11, 1977). Since it was listed as endangered, the Act has been and continues to be the primary Federal law that affords protection to *M. clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea.* The Service's responsibilities in administering the Act include sections 7, 9, and 10.

Section 7(a)(1) of the Act requires all Federal agencies, including the Navy, to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species. Section 7(a)(2) of the Act requires Federal agencies, including the Service and the Navy, to ensure that actions they fund, authorize, or carry out do not ''jeopardize'' the continued existence of a listed species or result in the destruction or adverse modification of habitat in areas designated by the Service to be critical. Critical habitat has not been designated or proposed for this taxon. A jeopardy determination is made for a project that is reasonably expected, either directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its reproduction, numbers, or distribution (50 CFR 402.02). A non-jeopardy opinion may include reasonable and prudent measures that minimize the extent of impacts to listed species associated with a project. Under section 9(a)(2) of the Act, with respect to endangered plant taxa, it is unlawful to remove and reduce to possession (collect) any such taxon from areas under Federal jurisdiction; maliciously damage or destroy any such taxon on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.

Since it was first listed in 1977, the Navy has consulted and coordinated with us regarding the effects of various activities on *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea.* In November 2008, we completed a biological opinion describing the impact of the Navy's military training program proposed in the MOFMP on 11 federally listed species that occur on San Clemente Island (USFWS 2008, pp. 1–237). We considered the status and distribution of *M. clementinus,* the various management strategies, and the avoidance and minimization measures in place and those the Navy will implement with the new plan (as well as *A. d.* var. *traskiae* and *C. grisea*). Additionally, the Service made conservation recommendations within the biological opinion, including: (1) Considering recommended actions from the 5-year review in the upcoming revision of the INRMP, and (2) propagation and outplanting of narrowly distributed, listed plant species. We concluded that ongoing and likely impacts from the proposed increases in military training activities would not jeopardize the continued existence of *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* (USFWS 2008, pp. 1–237).

Thus, listing *Malacothamnus clementinus* provided a variety of protections, including the prohibitions against removing or destroying plants within areas under Federal jurisdiction and the conservation mandates of section 7 for all Federal agencies. If *M. clementinus* were not listed, these protections would not be provided. Thus, we must evaluate whether other regulatory mechanisms would provide adequate protections absent the protections of the Act.

Other Federal Protections

National Environmental Policy Act (NEPA)

All Federal agencies are required to adhere to the National Environmental Policy Act (NEPA) of 1970 (42 U.S.C. 4321 *et seq.*) for projects they fund, authorize, or carry out. The Council on Environmental Quality's regulations for implementing NEPA (40 CFR parts 1500–1518) state that agencies shall include a discussion on the environmental impacts of the various project alternatives (including the proposed action), any adverse environmental effects that cannot be avoided, and any irreversible or irretrievable commitments of resources involved (40 CFR part 1502). The NEPA is a disclosure law, and does not require subsequent minimization or mitigation measures by the Federal agency involved. Although Federal agencies may include conservation measures for *Malacothamnus clementinus* as a result of the NEPA process, any such measures are typically voluntary in nature and are not required by the statute. NEPA does not itself regulate activities that might affect *M. clementinus,* but it does require full evaluation and disclosure of information regarding the effects of contemplated Federal actions on sensitive species and their habitats.

On San Clemente Island, the Navy must meet the NEPA requirements for actions significantly affecting the quality of the human environment. Typically, the Navy prepares Environmental Assessments and Environmental Impact Statements on operation plans and new or expanding training actions. Absent the listing of *M. clementinus,* we would expect the Navy to continue to meet the procedural requirements of NEPA for its actions, including evaluating the environmental impacts to rare plant species and other natural resources. However, as explained above, NEPA does not itself regulate activities that might affect *M. clementinus.*

Sikes Act Improvement Act (Sikes Act)

The Sikes Act (16 U.S.C. 670) authorizes the Secretary of Defense to develop cooperative plans with the Secretaries of Agriculture and the Interior for natural resources on public lands. The Sikes Act Improvement Act of 1997 requires Department of Defense installations to prepare Integrated Natural Resources Management Plans (INRMPs) that provide for the conservation and rehabilitation of natural resources on military lands consistent with the use of military installations to ensure the readiness of the Armed Forces. An INRMP is a plan intended ''* * * to guide installation commanders in managing their natural resources in a manner that is consistent with the sustainability of those resources while ensuring continued support of the military mission'' (Navy 2002, p. 1–1). INRMPs are developed in coordination with the State and the Service, and are generally updated every 5 years. Although an INRMP is technically not a regulatory mechanism because its implementation is subject to funding availability, it is an important guiding document that helps to integrate natural resource protection with military readiness and training.

San Clemente Island Integrated Natural Resources Management Plan (INRMP)

Pursuant to the Sikes Act, the Navy adopted an INRMP for San Clemente Island that targets multiple objectives towards protection of *Malacothamnus clementinus* and its habitat, and helps to reduce threats to this taxon (Navy 2002). The INRMP includes provisions to comply with the Endangered Species Act, the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601), the Resources Conservation and Recovery Act (42 U.S.C. 6901), the Federal Noxious Weed Act of 1974 (7 U.S.C. 2801), and the Soil Conservation Act (16 U.S.C 3B). Goals and objectives in the INRMP for specified management units on the island are identified based on each unit's ranking for both military and natural resource value. Natural resource management objectives for the management units are stepped down from broader natural resource objectives identified for species and habitats. Of relevance to the protection of *M. clementinus,* the INRMP includes an objective to: ''Protect, monitor, and restore plants and cryptograms in order to manage for their long-term sustainability on the island'' (Navy 2002, p. 4–39).

The INRMP specifically includes the following objectives for *Malacothamnus clementinus* management: removal of nonnatives, restoration of native plant communities, monitoring of the species, studies of the species' response to fire, and studies and inventory of insect pollinators (Navy 2002, pp. D–20, D–21). Other INRMP strategies that target the plant communities within which the three species occur include: controlling erosion, with priority given to locations where erosion may be affecting listed species; producing a new vegetation map; reducing nonnative plant cover from 1992–1993 baseline levels; managing the size and intervals of fires; experimenting with fire management to improve native plant dominance while protecting sensitive plant occurrences; and conducting genetic and biological studies of *M. clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* across the island.

To date, multiple INRMP management strategies, or aspects of them, have been implemented. The Navy has implemented rare plant surveys and has documented new occurrences of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* on the island. Genetic research and natural history studies have also been performed. Concerted efforts have been made to control escape of fire from military training activities, and the Navy has annually implemented nonnative plant species control activities, with a focus on species that have the potential to compete with listed species. Overall, considerable progress has been made toward the identified INRMP goals to maintain sustainable occurrences and implement strategies that help reduce threats to *M. clementinus, A. d.* var. *traskiae,* and *C. grisea.*

The INRMP is an important guiding document that helps to integrate the military's mission with natural resource protection on San Clemente Island. Although the INRMP includes objectives targeted toward habitat protection of optimal *Malacothamnus Clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* habitat, Navy operational needs may diverge from INRMP natural resource goals. For example, control measures for erosion, fire, and nonnatives described in the INRMP may not be implemented effectively or consistently in those areas that are operationally closed due to the presence of unexploded ordnance. The MOFMP, Erosion Control Plan, and nonnative plant species control conducted on the island are discussed above under *Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.* Absent listing under the Act, the Navy would still be required to develop and

implement INRMPs under the Sikes Act. However, as noted under the other factors, while the INRMP helps to ameliorate threats and provides some protection for *M. clementinus* occurrences, those occurrences within Impact Areas or operationally closed areas may not benefit from the conservation measures. While the INRMP has reduced the severity of threats and contributed to conservation of the species, it still allows for land use consistent with military readiness and training. Thus, Navy activities will continue to impact *M. clementinus* as described under Factor A.

State Protections

Since the time of listing, *Malacothamnus clementinus* has benefited from additional State protections under the Native Plant Protection Act (NPPA) and California Endangered Species Act (CESA; listed 1982). However, the range of *M. clementinus* is restricted to a Federal military installation, so listing under NPPA and CESA may only afford protection to this species in rare instances when the lead agency is a non-Federal agency or when proposed activities fall under other State laws.

Summary of Factor D

In continuance of a long history of cooperative conservation efforts, the Navy has implemented several conservation actions that benefit this taxon. The Navy has a MOFMP to reduce the risk of fire on the island and a nonnative plant species control program. Following review of the Navy's MOFMP, we issued a non-jeopardy biological opinion, which included measures that the Navy has implemented to manage fires and avoid and minimize the impacts of military activities on listed plants. The provisions included in the San Clemente Island INRMP provide protection to accessible *Malacothamnus clementinus* occurrences, and adaptive management of their habitat, to help address threats from military activities and nonnative plants. However, as indicated in the discussion under *Factor A,* not all of the management tools described in the INRMP are in place, and conservation measures may not be implemented at several of the closed occurrences of the species. *Malacothamnus clementinus* occurrences are afforded some protection through Federal and military mechanisms. However, in the absence of the Act, the existing regulatory mechanisms are not currently adequate to provide for the long-term conservation of *M. clementinus*.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

The 1977 listing rule identified nonnatives as a threat to *Malacothamnus clementinus* under *Factor E:* competition from nonnative plants (42 FR 40682; August 11, 1977). In this 5-factor analysis, impacts from nonnative plants are discussed above under *Factor A* as a threat to habitat. Other Factor E threats identified since listing that currently impact *M. clementinus* plants include: (1) Movement of vehicles and troops, (2) fire, (3) climate change, and (4) genetic diversity. Factor E addresses threats to individuals of the species, rather than the habitat modification threats that are discussed in Factor A. Therefore, while some threats are discussed in both sections, in this section we are focusing on the direct impacts to individuals of *M. clementinus*.

Movement of Vehicles and Troops

Military training activities within SWAT, TAR, and the IOA often entail the movement of vehicles and troops over the landscape with the potential of trampling or crushing individual plants of all three species. SWATs are large areas that typically support the movement of small groups to reach an objective or destination. The dispersed movement of troops through these areas is likely to result in occasional trampling of plants, with minor or temporary impacts at the occurrence level. TARs are generally smaller areas designated to accommodate intensive use and bombardment. Plants located within TARs are therefore more vulnerable to being trampled by vehicle and troop movements, particularly as the level of military training increases in these areas.

Use of the IOA, at its highest intensity, involves the movement of battalion-sized landings of troops (1,500 individuals) from the northern to southern end of the island several times a year. During such operations, it is anticipated that about half of the troops will travel on roads in vehicles, while the other half will proceed on foot. Based on the distribution of *Malacothamnus clementinus* occurrences and type of troop movements likely to occur, impacts due to trampling and crushing are likely to occur within the IOA, along roads and in the Impact Areas. Specifically, major troop movements and vehicle landings are planned through Horse Beach and the Horse Beach Canyon occurrence, with troops and assault vehicles moving north along Horse Beach Road from the beach (USFWS 2008, pp. 30, 41). These operations could affect the Horse Beach Canyon and Lower China Canyon occurrences (USFWS 2008, pp. 85–86).

The implementation of conservation measures and the status of the plants at Horse Beach Canyon, Upper and Lower China Canyon, and Lemon Tank Canyon are currently unknown because they are closed to natural resource personnel (USFWS 2008, p. 50). Four of 11 occurrences (36 percent; Lower China Canyon, Upper China Canyon, Horse Beach Canyon, and Lemon Tank Canyon) are partially or wholly within the boundaries of a training area (Impact Area or SWAT) and are likely to sustain some losses due to trampling associated with the proposed increases in troop and vehicle movements. With the lack of access to all four occurrences, the management of this threat and the ability to assess the plant's condition is compromised, and the full effects of trampling on the species are unknown. Therefore, the movement of troops and vehicles is still considered a threat to *M. clementinus*.

Fire

Although not specifically mentioned in the listing rule, intense or frequent fires impact plants at 6 of the 11 occurrences (54 percent) of *Malacothamnus clementinus.* In the *Factor A* discussion above, we addressed impacts of fire on the habitat. This section includes discussion on the discrete threat to individuals of *M. clementinus*. As discussed in the Background section, it is unknown if *M. clementinus* is adapted to fire, though it is likely that this species is resilient to occasional fires (USFWS 1984. p. 48; Navy 2002, D–20; USFWS 2007a, p. 3). No direct studies have been done on the effects of fire on *M. clementinus;* however, its continued presence in areas that have burned (such as in SHOBA), and its ability to vegetatively reproduce, suggest it is at least tolerant of periodic fire. The species' adaptation to fire frequency is unknown. In areas that burn on a more frequent basis, the seed bank may become depleted if individuals burn before they produce seeds. Additionally, *M. clementinus* was observed to have low numbers of seeds in natural populations (Junak and Wilken 1998, p. 291). Frequent burns might exhaust the already small seed bank, and inhibit reproduction in *M. clementinus*.

Malacothamnus clementinus occurs in some areas of the island that may experience elevated fire frequency, such as in SHOBA and especially within the Impact Areas (Lower China Canyon, Upper China Canyon, and Horse Beach

Canyon) (see *Factor A* above). The Navy's fire management practices are expected to minimize ignitions as well as the spread of fires (see *Factor A*). However, fires ignited within the boundaries of the Impact Areas will not be suppressed due to closures and safety restrictions within these areas. This would affect the three occurrences *of M. clementinus* found within these areas. The Navy conducts annual reviews of fire management and fire occurrences to allow for adaptive management. These measures should minimize the frequency and spread of fires that could result in the loss of *M. clementinus* individuals or occurrences. The Navy's ongoing implementation of the MOFMP will limit the frequency with which fires escape Impact Areas and TAR, and that, through the annual review process, the Navy will identify mechanisms to reduce fire return intervals in areas not designated for incendiary use (USFWS 2008, pp. 76–91).

Although the Navy has planned and implemented fire management, fire still affects six occurrences of *Malacothamnus clementinus.* Three of these occurrences fall within areas that are closed to natural resources management and prone to fire due to bombing of the area. Therefore, fires within these areas are allowed to burn, affecting the individuals and occurrences. Due to these conditions and the continued impacts of fire within SHOBA, fire remains a Factor E threat to the existence of *M. clementinus* both currently and in the future.

Climate Change

Consideration of climate change is a component of our analyses under the Endangered Species Act, and applies in this finding to our analysis of all three taxa. In general terms, ''climate change'' refers to a change in the state of the climate (whether due to natural variability, human activity, or both) that can be identified by changes in the mean or variability of its properties, and that persists for an extended period—typically decades or longer (Intergovernmental Panel on Climate Change (IPCC) 2007a, p. 78).

Changes in climate are occurring. Examples include warming of the global climate system over recent decades, and substantial increases in precipitation in some regions of the world and decreases in other regions (for these and other examples see IPCC 2007a, p. 30; Solomon *et al.* 2007, pp. 35–54, 82–85).

Most of the observed increase in global average temperature since the mid-20th century cannot be explained by natural variability in climate, and is very likely due to the observed increase in greenhouse gas concentrations in the atmosphere as a result of human activities, particularly emissions of carbon dioxide from fossil fuel use (IPCC 2007a, p. 5 and Figure SPM.3; Solomon *et al.* 2007, pp. 21–35). Therefore, to project future changes in temperature and other climate conditions, scientists use a variety of climate models (which include consideration of natural processes and variability) in conjunction with various scenarios of potential levels and timing of greenhouse gas emissions (e.g., Meehl *et al.* 2007 entire; Ganguly *et al.* 2009, pp. 11555, 15558; Prinn *et al.* 2011, pp. 527, 529).

The projected magnitude of average global warming for this century is very similar under all combinations of models and emissions scenarios until about 2030. Thereafter, the projections show greater divergence across scenarios. Despite these differences in projected magnitude, however, the overall trajectory is one of increased warming throughout this century under all scenarios, including those which assume a reduction of greenhouse gas emissions (Meehl *et al.* 2007, pp. 760–764; Ganguly *et al.* 2009, pp. 15555–15558; Prinn *et al.* 2011, pp. 527, 529). (For examples of other global climate projections, see IPCC 2007b, p. 8).

Various types of changes in climate can have direct or indirect effects on species and these may be positive or negative depending on the species and other relevant considerations, including interacting effects with existing habitat fragmentation or other non-climate variables. There are three main components of vulnerability to climate change: Exposure to changes in climate, sensitivity to such changes, and adaptive capacity (IPCC 2007, p. 89; Glick *et al* 2011, pp. 19–22). Because aspects of these components can vary by species and situation, as can interactions among climatic and non climatic conditions, there is no single way to conduct our analyses. We use the best scientific and commercial data available to identify potential impacts and responses by species that may arise in association with different components of climate change, including interactions with non climatic conditions.

As is the case with all potential threats, if a species is currently affected or is expected to be affected in a negative way by one or more climate-related impacts, this does not necessarily mean the species meets the definition of a threatened or endangered species as defined under the Act. The impacts of climate change and other conditions would need to be to the level that the species is in danger of extinction, or likely to become so, throughout all or a significant portion of its range. If a species is listed as threatened or endangered, knowledge regarding the species' vulnerability to, and impacts from, climate-associated changes in environmental conditions can be used to help devise appropriate strategies for its recovery.

While projections from global climate model simulations are informative and in some cases are the only or the best scientific information available, various downscaling methods are being used to provide higher-resolution projections that are more relevant to the spatial scales used to assess impacts to a given species (see Glick *et al,* 2011, pp. 58–61). With regard to the area of analysis for the San Clemente Island and specifically for the three species at issue here, downscaled projections are available at least with respect to southern California.

San Clemente Island is located within a Mediterranean climatic regime, but with a significant maritime influence. Climate change models indicate a 1.8 to 5.4 degrees Fahrenheit (1 to 3 degrees Celsius) increase in average temperature for southern California by the year 2070 (Field *et al.* 1999, p. 5; Cayan *et al.* 2008, p. S26; PRBO 2011, p. 40). Over the same time span, a 10 to 37 percent decrease in annual precipitation is predicted (PRBO 2011, p. 40), though other models predict little to no change in annual precipitation (Field *et al.* 1999, pp. 8–9; Cayan *et al.* 2008, p. S26). Although the island has a short rainy season, the presence of fog during the summer months helps to reduce drought stress for many plant species (Halvorson *et al.* 1988, p. 111; Fischer *et al.* 2009, p. 783). However, fog projections remain uncertain (Field *et al.* 1999, pp. 21–22). There is also substantial uncertainty in precipitation projections, and relatively little consensus concerning precipitation patterns and projections for southwestern California (PRBO 2011, p. 40). San Clemente Island typically gets less rainfall than the neighboring mainland areas (Tierra Data 2005, p. 4). Therefore, the models may underestimate the effects of precipitation changes on island vegetation. Additionally, *Malacothamnus clementinus* typically occurs on the western side of the island, which is a less productive and drier climate (Tierra Data 2005, p. 7). Less rainfall and warmer air temperatures could limit the range of *M. clementinus,* although there is no direct research on the effects of climate change on the species.

The impacts of predicted future climate change to *Malacothamnus clementinus* remain unclear. The best available information does not provide sufficient certainty on how and when climate change will affect the species, the extent of average temperature increases in California, or potential changes to the level of threat posed by fire on San Clemente Island. The most recent literature on climate change includes predictions of hydrological changes, higher temperatures, and expansion of drought areas (IPCC 2007a, pp. 1–18). While we recognize that climate change is an important issue with potential effects to listed species and their habitats, the best available information does not inform accurate predictions regarding its impacts to *M. Clementinus* at this time.

Genetic Diversity

As discussed in the Background section, *Malacothamnus clementinus* has low genetic variability when compared with other island endemic plant species (Helenurm 1999, p. 40). This lack of diversity could hinder the species' ability to persist through a fluctuating environment or stochastic event. Although the number of known occurrences of *M. clementinus* has increased from 3 to 11 since its listing, there appears to be little gene flow among occurrences, and each comprises a relatively small number of genetically distinct individuals (Junak and Wilken 1998, p. 290; Helenurm 1999, p. 39). Genetic fitness typically decreases with decreasing genetic variation and population size (Leimu *et al.* 2006, p. 942). Specifically, small population size and low levels of genetic interchange make *M. clementinus* occurrences particularly vulnerable to inbreeding depression and loss of genetic variability due to genetic drift (the change in the frequency of appearance of a gene in a population of organisms due to chance or random events) (Ellstrand and Elam 1993, p. 217).

Genetic analysis suggests that *M. clementinus* has very low genetic variation at both the species and population levels (Helenurm 1997, p. 50; Helenurm 1999, p. 39), even far below average when compared to other endemic plant species (Helernurm 1999, p. 39). Low genetic variation may affect the ability of occurrences to adjust to novel or fluctuating environments, survive stochastic events, or maintain high levels of reproductive performance (Huenneke 1991, p. 40). This constitutes a species and rangewide threat for which there is no immediate solution or amelioration.

Malacothamnus clementinus occurrences have low seed production, suggesting the existence of a self-incompatibility mechanism (Helenurm 1997, p. 50; Junak and Wilken 1998, p. 291; Helenurm 1999, p. 39). Low seed production may also be the result of low pollinator visitation and, in combination with low genetic diversity, could contribute to observed low recruitment in populations (Huenneke 1991, pp. 37–40; Junak and Wilken 1998, p. 291; Helenurm 1999, pp. 39–40). Although studies show that patches of plants are not made up of a single clonal individual (clump of genetically identical stems resulting from vegetative reproduction), it is still possible that patches comprise closely related individuals that share alleles controlling their ability to successfully reproduce with each other (Helenurm 1999, pp. 39–40). Although this species has apparently expanded its range from that known at the time of listing and persisted through habitat disturbance, it may still remain susceptible to extirpation from low genetic variation and genetic drift. A reduction in occurrence size through years of grazing could have substantially lowered genetic variation (Helenurm 2005, p. 1221), which could decrease genetic fitness and compromise the species' ability to adapt to stochastic events (Huenneke 1991, p. 40). The apparent loss of genetic diversity resulting in current low genetic variation and low recruitment constitute a species and rangewide threat to *M. clementinus.*

Summary of Factor E

Threats associated with trampling from military activities, fire, climate change, and low genetic diversity continue to impact *Malacothamnus clementinus* at all of the 11 occurrences on San Clemente Island. Trampling and crushing of individual plants are likely to increase at four occurrences (36 percent) in association with increased training levels on the island. However, this taxon has expanded its distribution on the island and the Navy is implementing conservation measures that will improve conditions for *M. clementinus.* Military training activities have the potential to ignite fires within occurrences or that spread to habitat supporting this species. In preparation for these training efforts, the Navy implemented a MOFMP to limit the frequency of fires escaping from the Impact Areas, although suppression likely will not occur within the boundaries of the Impact Areas. Climate change may also likely influence *M. clementinus,* though the effects are largely unknown. The genetic fitness of *M. clementinus* may be threatened by low genetic diversity and small population size. The threats described here affect all of the occurrences of *M. clementinus* both now and in the future; therefore, these threats also affect its recovery.

Combination of Factors—Malacothamnus clementinus

A species may be affected by more than one threat in combination. Within the preceding review of the five listing factors, we have identified multiple threats that may have interrelated impacts on *Malacothamnus clementinus* (these interrelated impacts also occur for *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea*). For example, fires (Factor A and E) may be more intense or frequent in the habitat if there are greater amounts of nonnative grass (Factor A) present in the vegetative community. Similarly, fires (Factor A and E) also may become more frequent if the climate changes (Factor E) into a drier, hotter environment. The movement of troops and vehicles (Factor E) and land use (Factor A) can also create more disturbance and erosion (Factor A) in *M. clementinus'* habitat (as well as *A. d.* var. *traskiae* and *C. grisea* habitat). The historical past on San Clemente is an illustration of interacting threats: Nonnative herbivores (Factor C) ate and killed much of the vegetation, causing greater impacts of erosion (Factor A) on the island. Thus, the species' productivity may be reduced because of these threats, either singularly or in combination. However, it is not necessarily easy to determine (nor is it necessarily determinable) whether a particular threat is the primary threat having the greatest effect on the viability of the species, or whether it is exacerbated by or working in combination with other threats to have cumulative or synergistic effects on the species. While the combination of factors is a threat to the existence of *M. clementinus,* we are unable to determine the magnitude or extent of cumulative or synergistic effects of the combination of factors on the viability of the species at this time.

***Acmispon dendroideus* var. *traskiae* (San Clemente Island lotus)**

In the 2007 status review, we acknowledged that the predominant threat at listing (grazing and rooting from feral herbivores) was ameliorated with the removal of goats and pigs from the island in 1992 (USFWS 2007b, pp. 1–22). Threats to *Acmispon dendroideus* var. *traskiae* identified in the 2007 status review include: (1) Erosion, (2) nonnative species, (3) fire,

(4) land use, (5) access to SHOBA, and (6) hybridization. Impacts from erosion, nonnatives, fire, and land use are discussed below under *Factor A,* and hybridization is discussed under *Factor E* below. As discussed above, access to SHOBA is not considered a threat, though it limits our ability to assess all occurrences of the taxon reviewed here.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The final listing rule (42 FR 40682; August 11, 1977) identified the following threats to *Acmispon dendroideus* var. *traskiae:* Habitat alteration and destruction, competition from nonnative species, and direct predation caused by nonnative herbivores (goats and pigs). The vegetation on San Clemente Island has rebounded, and the status of many rare plant occurrences, including *A. d.* var. *traskiae,* has improved with the final removal of herbivores in 1992 (Junak and Wilken 1998, p. 18; Junak 2006a, pers. comm.). Although the principle threat to *A. d.* var. *traskiae* identified in the final listing rule has been eliminated, erosion as a result of overgrazing and invasive nonnative plants remain ongoing threats to habitat of *A. d.* var. *traskiae.* Habitat alteration and disturbance from the Navy's use of the island for military operation and training were identified as additional threats to the habitats occupied by *A. d.* var. *traskiae* in the Recovery Plan and the 2007 status review (USFWS 1984, pp. 58–63; USFWS 2007b, pp. 11, 12). Additional threats recognized since listing include land use by military training activities, and fire. As outlined below, we discuss impacts of the following threats that affect the habitat or range of *A. d.* var. *traskiae:* (1) Land use, (2) erosion, (3) nonnative plants, and (4) fire.

Land Use

Eight of 29 *Acmispon dendroideus* var. *traskiae* occurrences (28 percent; Eagle Canyon, Bryce Canyon, North Mosquito Cove, Canchalagua Canyon, Thirst Canyon, Cave Canyon, Horse Canyon, and Pyramid Head) occur within SHOBA, where impacts are more likely. Most of the land area of the SHOBA serves as a buffer from the Impact Areas, although military training in parts of SHOBA could result in habitat alteration due to OHV and large-scale troop movements through the military impact and training areas (IOA and AVMA). Most of the occurrences within SHOBA are located along the eastern escarpment, which should provide a level of protection from training impacts. Large-scale troop movements are less likely in this area, because of the extreme slope of the escarpment. Training impacts may become difficult to assess and manage with the recent closure of the eastern escarpment due to unexploded ordnance.

Four of 29 of *A. d.* var. *traskiae* occurrences (14 percent; Canchalagua Canyon, Middle Island Plateau, North Mosquito Cove, and Eagle Canyon) are within or partially within the IOA and may experience direct impacts, while nine occurrences (31 percent; Upper Middle Ranch Canyon, Warren Canyon, Horton Canyon, Upper Wallrock Canyon, Tota Canyon, Lemon Tank Canyon, Larkspur Canyon, Chamish Canyon, and North Island Terraces) are within 1,000 ft (305 m) of the IOA, and could experience diffuse or accidental impacts associated with troop movement. These areas near the IOA are at less risk of disturbance than the occurrences within the IOA, and would only be likely to sustain diffuse or accidental impacts to the habitat. While the increase in military training could affect the species, the Navy through implementation of the INRMP will avoid and minimize impacts to individuals or occurrences of *A. d.* var. *traskiae* (as a rare plant species), to the extent practicable while meeting operational needs (Navy 2002, p. 1–2) (see above discussion on Land Use under *Malacothamnus clementine—Factor A*).

Because of the taxon's close proximity to Navy facilities, military activities have the potential to impact habitat at one of the largest known occurrences of *Acmispon dendroideus* var. *traskiae,* near Wilson Cove. All construction, maintenance, and training activities in the Wilson Cove area go through a site approval request process. Through this process, the areas are assessed to see if the activities will potentially impact any listed species, including *A. d.* var. *traskiae.* Part of this occurrence is within a TAR where tactical training and movement are projected to occur, possibly causing habitat damage through troop traffic (USFWS 2008, pp. 119–120). Work was done recently at Wilson Cove that affected *A. d.* var. *traskiae,* and the Navy assessed the impact to be a loss of habitat occupied by 50 plants. The Navy worked to salvage plant material and outplant back to the site. Thus far, this outplanting has been successful, the habitat has rebounded, and more plants are present in the area than before the work was done (Munson 2011a, pers. comm.).

Twenty-four of 29 occurrences (83 percent) of *A. d.* var. *traskiae* are located outside of heavily impacted training areas. Though five occurrences (17 percent; Wilson Cove, Canchalagua Canyon, Middle Island Plateau, North Mosquito Cove, and Eagle Canyon) are partially or wholly within the boundaries of an IOA or TAR, many of the impacts to these occurrences would be diffuse, and are unlikely to have a high impact on the species' habitat. Although land use is likely to impact *A. d.* var. *traskiae* habitat, the Navy has demonstrated its commitment to help conserve and manage listed species on the island. Land use appears to pose a high-magnitude threat to the habitat of a small percentage of the occurrences of *A. d.* var. *traskiae* on San Clemente Island.

Erosion

Erosion and associated soil loss caused by browsing of feral goats and rooting of feral pigs likely modified the island's habitat (Navy 2002, p. 1–14). Defoliation from overgrazing increased erosion over much of San Clemente Island. In the INRMP, erosion was identified as a threat to the canyon woodland habitat and maritime desert scrub where *Acmispon dendroideus* var. *traskiae* occurs (Navy 2002, p. 4–3). Gullying and other processes may concentrate surface runoff to unnatural levels, leading to accelerated erosion in the canyons below (Tierra Data Inc. 2007, p. 6). *Acmispon dendroideus* var. *traskiae* occurs within steep canyon areas where such concentration of flows may be a threat to its habitat or range.

Although more vegetative cover is now present than at the time of listing, erosion is still a threat to the recovery of *Acmispon dendroideus* var. *traskiae,* especially in areas where it grows in close proximity to roads. The Navy studied the potential for erosion from several proposed military activities (Tierra Data Inc. 2007, pp. 1–45, Appendices). Increased military activities, especially where the taxon is located within training area boundaries (IOA), are expected to cause erosion through soil compaction or other soil disturbances in occupied habitat areas associated with roadways or vehicle maneuver areas (Tierra Data Inc. 2007, p. 12). Four of 29 *A. d.* var. *traskiae* occurrences (14 percent; Middle Island Plateau, Canchalagua Canyon, North Mosquito Cove, and Eagle Canyon) are within or partially within the IOA, and are likely to be further impacted by erosion (Table 1). Three of these occurrences (Canchalagua Canyon, North Mosquito Cove, and Eagle Canyon) are along the eastern escarpment, which has recently been closed to biological monitoring due to

unexploded ordnance. The threat of erosion to this area will be difficult to assess if the closure remains into the future. Nine of 29 occurrences (31 percent; Upper Middle Ranch Canyon, Warren Canyon, Horton Canyon, Upper Wallrock Canyon, Tota Canyon, Lemon Tank Canyon, Larkspur Canyon, Chamish Canyon, and Northern Island Terraces) are near the IOA (within 1,000 ft (305 m)), and could experience erosion from nearby training activities.

Roads can concentrate water flow causing incised channels and erosion of slopes (Forman and Alexander 1998, pp. 216–217). This increased erosion around roads can degrade habitat, especially along the steep canyons associated with the eastern escarpment of the island. Nine of 29 *Acmispon dendroideus* var. *traskiae* occurrences (31 percent; Eel Cove Canyon, Seal Cove Terraces, Lemon Tank Canyon, Wilson's Cove, North Wilson's Cove, Upper Middle Ranch Canyon, Eagle Canyon, North Mosquito Cove, and Canchalagua Canyon) are within 500 ft (152 m) of a road on the island (Forman and Alexander 1998, p. 217). These occurrences could be subject to diffuse disturbance and road effects that degrade habitat quality. The largest known occurrence of *A. d.* var. *traskiae,* Wilson Cove, occurs on gradual or steep slopes where erosion is evident (USFWS 2008, p. 117). Military activities in this area have the potential to adversely affect the species habitat due to the species' proximity to Navy facilities and the level of human activity and traffic in the area.

The Navy incorporates erosion control measures into all site feasibility studies and project planning, design, and construction to minimize the potential to exacerbate existing erosion and avoid impacts to listed species (Munson 2011a, pers. comm.). The INRMP requires that all projects include erosion conservation work and associated funding (Navy 2002, p. 4–89). These conservation actions include best management practices for construction and engineering, choosing sites that are capable of sustaining disturbance with minimum soil erosion, and stabilizing disturbed sites with native plants (Navy 2002, pp. 4–89—4–91). Additionally, large-scale island-wide maneuvers with assault vehicles have been postponed until an erosion control plan is drafted and implemented. The erosion control plan for San Clemente Island is being developed to reduce the impacts of erosion to *Acmispon dendroideus* var. *traskiae* habitat in areas likely to experience increased and expanded military operations (Munson 2011a, pers. comm.). This erosion control plan will address military operations associated with the IOA, AVMA, and AFP; however, since the plan is not yet finalized, it does not currently ameliorate the noted threats from erosion.

The processes and results of erosion are threats to the habitat of *Acmispon dendroideus* var. *traskiae,* particularly to 17 of 29 occurrences (59 percent; Middle Island Plateau, Canchalagua Canyon, North Mosquito Cove, Eagle Canyon, Upper Middle Ranch Canyon, Warren Canyon, Horton Canyon, Upper Wallrock Canyon, Tota Canyon, Lemon Tank Canyon, Larkspur Canyon, Chamish Canyon, North Island Terraces, Eel Cove Canyon, Seal Cove Terraces, Wilson Cove, and North Wilson Cove) that are within an IOA, within 1,000 ft (305 m) of an IOA, or within 500 ft (152 m) of a road. Erosion may lead to overall habitat degradation and the loss of individuals or groupings of plants in a given area. However, this taxon has persisted despite current levels of erosion. The processes and results of erosion are island-wide threats to the habitat or range of *A. d.* var. *traskiae,* particularly to the 17 occurrences in or adjacent to military training areas or roads. Therefore, erosion is still considered a threat to the existence of *A. d.* var. *traskiae.*

Nonnative Species

One of the threats to *Acmispon dendroideus* var. *traskiae* identified in the final listing rule is the spread of nonnative plants into its habitat (42 FR 40682). Nonnative plants can diminish the abundance or survival of native species by altering natural ecosystem processes such as fire regimes, nutrient cycling, hydrology, and energy budgets, and competing with them for water, space, light, and nutrients (Zink *et al.* 1995, p. 307; Brooks 1999, pp. 16–17; Mack *et al.* 2000, p. 689). Nonnative species of particular concern include *Avena barbata* (slender oat), *Bromus* spp., *Foeniculum vulgare,* and *Brassica tournefortii,* which have already invaded the habitat of most *A. d.* var. *traskiae* occurrences. Another nonnative species, *Carpobrotus edulis* (iceplant), also appears to be hindering the recovery of *A. d.* var. *traskiae* (Allan 1999, p. 92). This nonnative species occupies large areas of Wilson Cove where it may alter the habitat (Allan 1999, p. 92) by changing vegetation structure and creating an environment less hospitable to *A. d.* var. *traskiae.* Annual grasses vary in abundance with rainfall, potentially changing the vegetative community from shrubs to grasses and increasing the fuel load in wet years (see *Factor A—Fire* section below).

Although previous invasions of nonnatives probably occurred through introductions in grazing fodder, current nonnative species invasions are typically introduced by military activities and training on the island. Nonnative plants constitute a rangewide threat to the habitat of all native plants on San Clemente Island, including all occurrences of *Acmispon dendroideus* var. *traskiae.* Nine of 29 occurrences (31 percent; Eel Cove Canyon, Seal Cove Terraces, Lemon Tank Canyon, Wilson's Cove, North Wilson's Cove, Upper Middle Ranch Canyon, Eagle Canyon, North Mosquito Cove, and Canchalagua Canyon) are within 500 ft (152 m) of roads on the island, and may be subject to diffuse disturbance and road effects that degrade habitat quality along the road (Forman and Alexander 1998, p. 217). Roadsides tend to provide conditions (high disturbance, seed dispersal from vehicles, ample light and water) preferable to nonnative species (Forman and Alexander 1998, p. 210).

Potential impacts from nonnative plants are minimized through annual implementation of the Navy's island-wide nonnative plant control program (O'Connor 2009b, pers. comm.; Munson 2011a, pers. comm.). The focus of the nonnative plant species program is to control plants on the island with the potential to adversely impact habitat of federally listed species (see above discussion on Nonnative Species under *Factor A—M. clementinus*). Although nonnative plants will continue to pose a risk to the habitat or range of *Acmispon dendroideus* var. *traskiae,* the Navy has taken steps to curtail habitat and plant community alteration from nonnative plants. To reduce the potential for transport of nonnative plants to the island, military and nonmilitary personnel inspect tactical ground vehicles and remove any visible plant material, dirt, or mud prior to going on San Clemente Island (USFWS 2008, p. 63). This precaution helps to control the movement of nonnative plants to the island, but once on the island, nonnative plants easily spread through the movement of vehicles from one area to another.

Acmispon dendroideus var. *traskiae* has persisted on the island and, despite the continued risk of encroachment to habitat by nonnatives, the range of this taxon has expanded from 6 to 29 occurrences since listing. Impacts from nonnative plants may be a persistent, but low-level, threat to *A. d.* var. *traskiae* habitat.

Fire

Fire was not considered a threat to habitat occupied by *Acmispon dendroideus* var. *traskiae* at the time of listing (42 FR 40682; August 11, 1977). Since that time, however, over 50 percent of the island has experienced at least one wildfire (Navy 2002, Map 3–3, p. 3–32), and some habitat has burned multiple times with very short intervals between fires (Navy 2002, Map 3–4, p. 3–33). The majority of fires are concentrated in SHOBA, potentially impacting habitat of 8 of 29 occurrences (28 percent; Eagle Canyon, Bryce Canyon, North Mosquito Cove, Canchalagua Canyon, Thirst Canyon, Cave Canyon, Horse Canyon, and Pyramid Head) where military training exercises within Impact Areas I and II employ live ordnance and incendiary devices. However, fires are occasionally ignited by activities north of SHOBA, such as training activities near Eel Point (possibly impacting Seal Cove Terraces and Eel Cove Canyon occurrences) (Navy 2002, Map 3–4, p. 3–33).

Increased fire frequency resulting from intensified military uses could lead to localized changes in vegetation on San Clemente Island. The Navy recently approved a significant expansion in the number of locations where live fire and demolition training will take place (Navy 2008a, pp. 2–3—2–38), including TAR north of SHOBA (TAR 17—Eel Cove Canyon and Seal Cove Terraces, and TAR 14 and 15—Larkspur and Chamish Canyon). These higher levels of training have not occurred in recent history, and will likely expand from current levels. In addition to demolitions, certain proposed munitions exercises involve the use of incendiary devices, such as illumination rounds, white phosphorous, and tracer rounds, which pose a high risk of fire ignition. Additionally, smoke, flares, and pyrotechnics are proposed for use within TAR 11 (Wilson's Cove) towards the eastern shore, and expanded live fire and demolition training is proposed within TAR 16 (Middle Island Plateau) towards the center of the island. It is likely that the fire pattern on the island will change in response to this increase in ignition sources, with fires becoming more common within and adjoining the training areas north of SHOBA.

At the time of listing, fire was not identified as a habitat threat because of lack of fire history and the low intensity of military training on the island. Since that time, military training has significantly increased, and we have better records of the fire frequency on the island. Approximately 14 of the 29 occurrences (48 percent) (Wilson's Cove, Middle Island Plateau, Eagle Canyon, Bryce Canyon, North Mosquito Cove, Canchalagua Canyon, Thirst Canyon, Cave Canyon, Horse Canyon, Pyramid Head, Eel Cove Canyon, Seal Cove Terraces, Larkspur Canyon, and Chamish Canyon) of *Acmispon dendroideus* var. *traskiae* fall within areas that may be subject to recurrent fire associated with military training (Table 1). This includes locations that fall within 1,000 ft (305 m) of TAR where the Navy conducts live fire and demolition training, and occurrences within SHOBA (SHOBA serves as a buffer for Impact Areas I and II). Fires that escape designated training areas may threaten habitat on other parts of the island, though, because of the broad distribution of the species, it is unlikely that one fire could spread throughout the entire range. The Navy's implementation of the MOFMP will limit the frequency with which fires escape impact areas and TAR. Through the annual review process, the Navy identifies mechanisms to reduce fire return intervals within areas where this taxon is concentrated (USFWS 2008, pp. 91–122). The Navy's implementation of an MOFMP will help to reduce the risk of habitat conversion by fire, although the habitat of *A. d.* var. *traskiae* could be altered by increased fire frequency and spread of nonnative grass. Although the threat is ameliorated through the MOFMP, fire remains an island-wide threat to *A. d.* var. *traskiae,* particularly to the 14 occurrences that fall within areas that may be subject to recurrent fire associated with military training.

Summary of Factor A

San Clemente Island was used for sheep ranching, cattle ranching, goat grazing, and pig farming from 1850 until 1934 (Navy 2002, pp. 3–4). The effects of these grazers, which were not completely removed from the island until 1992, on the habitat and plants were one of the original reasons for classifying *Acmispon dendroideus* var. *traskiae* as endangered in the 1977 listing rule (42 FR 40682). Currently, the habitat of *A. d.* var. *traskiae* is threatened by destruction and modification caused by land use, erosion, nonnative plants, and fire. To help ameliorate these threats, the Navy is implementing an MOFMP, an INRMP, and an island-wide nonnative species control program (Navy 2002, pp. 1–1–8–12; USFWS 2008, pp. 1–237). The MOFMP has been helpful in informing strategic decisions for training using live fire or incendiary devices. The Navy has postponed major troop and assault vehicle maneuvers across the island until an erosion control plan is completed. Natural resource managers have been successful in decreasing the prevalence of particularly destructive nonnatives, such as *Foeniculum vulgare.* Though increased impacts associated with military training could threaten the species, 24 of 29 occurrences (83 percent) of *A. d.* var. *traskiae* fall outside of training areas (IOA or TAR) where the most intensive habitat disturbances are likely to occur. While it is anticipated that military training activities, erosion, nonnatives, and fire will have ongoing impacts to the taxon's habitat, based on its distribution and current and anticipated conservation efforts, impacts from these threats are reduced and minimized for *A. d.* var. *traskiae.* Therefore, the threats to the habitat of *A. d.* var. *traskiae* will not likely impact most of the known occurrences both now and into the future.

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

In the listing rule (42 FR 40682; August 11, 1977), the Service did not identify any threats from overutilization, and there is no new information to indicate that overutilization is a threat to *Acmispon dendroideus* var. *traskiae.* Although voucher herbarium specimens of *A. d.* var. *traskiae* and seeds have been collected for research and seed banking, overutilization of *A. d.* var. *traskiae* for any purpose is not currently considered a threat nor is expected to be in the future.

Factor C. Disease or Predation

Grazing of feral goats and rooting of feral pigs were considered a direct threat to *Acmispon dendroideus* var. *traskiae* in the final listing rule (42 FR 40682; August 11, 1977). As stated above, however, nonnative mammalian herbivores were removed from San Clemente Island in 1992, and this threat was ameliorated, as recognized in our 2007 status review (USFWS 2007b, p. 13). Currently, no other predators or diseases on San Clemente Island are known to pose a significant threat to *A. d.* var. *traskiae* both now and in the future.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The Act requires us to examine the adequacy of existing regulatory mechanisms with respect to those existing and foreseeable threats that may affect *Acmispon dendroideus* var. *traskiae.* The inadequacy of existing regulatory mechanisms was not

considered a threat to *A. d.* var. *traskiae* at listing (42 FR 40682; August 11, 1977). Since it was listed as endangered, the Act has been and continues to be the primary Federal law that affords protection to *A. d.* var. *traskiae.* The Service's responsibilities in administering the Act include sections 7, 9, and 10 (see above discussion in the *Malacothamnus clementinus—Factor D* section for more information on the Service's responsibilities for all three species that are the subject of this Finding). Critical habitat has not been designated or proposed for this taxon. Listing *A. d.* var. *traskiae* provided a variety of protections, including the prohibitions against removing or destroying plants within areas under Federal jurisdiction and the conservation mandates of section 7 for all Federal agencies. If *A. d.* var. *traskiae* were not listed, these protections would not be provided. Thus, we must evaluate whether other regulatory mechanisms would provide adequate protections absent the protections of the Act.

Other Federal Protections

National Environmental Policy Act (NEPA)

All Federal agencies are required to adhere to the National Environmental Policy Act (NEPA) of 1970 (42 U.S.C. 4321 *et seq.*) for projects they fund, authorize, or carry out. The Council on Environmental Quality's regulations for implementing NEPA (40 CFR parts 1500–1518) state that agencies shall include a discussion on the environmental impacts of the various project alternatives (including the proposed action), any adverse environmental effects that cannot be avoided, and any irreversible or irretrievable commitments of resources involved (40 CFR part 1502). The NEPA itself is a disclosure law, and does not require subsequent minimization or mitigation measures by the Federal agency involved. Although Federal agencies may include conservation measures for *Acmispon dendroideus* var. *traskiae* as a result of the NEPA process, any such measures are typically voluntary in nature and are not required by the statute. NEPA does not itself regulate activities that might affect *A. d.* var. *traskiae,* but it does require full evaluation and disclosure of information regarding the effects of contemplated Federal actions on sensitive species and their habitats. On San Clemente Island, the Navy must meet the NEPA requirements for actions significantly affecting the quality of the human environment. Typically, the Navy prepares Environmental Assessments and Environmental Impact Statements on operation plans and new or expanding training actions. Absent the listing of *A. d.* var. *traskiae,* we would expect the Navy to continue to meet the procedural requirements of NEPA for its actions, including evaluating the environmental impacts to rare plant species and other natural resources. However, as explained above, NEPA does not itself regulate activities that might affect *A. d.* var. *traskiae.*

Sikes Act Improvement Act (Sikes Act)

The Sikes Act (16 U.S.C. 670) authorizes the Secretary of Defense to develop cooperative plans with the Secretaries of Agriculture and the Interior for natural resources on public lands. The Sikes Act Improvement Act of 1997 requires Department of Defense installations to prepare INRMPs that provide for the conservation and rehabilitation of natural resources on military lands consistent with the use of military installations to ensure the readiness of the Armed Forces. An INRMP is a plan intended ''* * * to guide installation commanders in managing their natural resources in a manner that is consistent with the sustainability of those resources while ensuring continued support of the military mission'' (Navy 2002, p. 1–1). INRMPs are developed in coordination with the State and the Service, and are generally updated every 5 years. Although an INRMP is technically not a regulatory mechanism because its implementation is subject to funding availability, it is an important guiding document that helps to integrate natural resource protection with military readiness and training.

San Clemente Island Integrated Natural Resources Management Plan (INRMP)

Pursuant to the Sikes Act, the Navy adopted an INRMP for San Clemente Island that identifies multiple objectives for protecting *Acmispon dendroideus* var. *traskiae* and its habitat to help to reduce threats to this taxon (Navy 2002). The INRMP discloses actions through the NEPA process and to comply with such legislation and regulations as the Endangered Species Act, Federal Noxious Weed Act of Act of 1974 (7 U.S.C. 2801), the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601), the Resources Conservation and Recovery Act (42 U.S.C. 6901), and Soil Conservation Act (16 U.S.C. 3B) (see above discussion on INRMPs under *Malacothamnus clementinus—Factor D).* Natural resource objectives of relevance to the protection of *A. d.* var. *traskiae* in the INRMP include: ''Protect, monitor, and restore plants and cryptograms in order to manage for their long-term sustainability on the island'' (Navy 2002, p. 4–39). The INRMP specifically includes the following objectives for *A. d.* var. *traskiae* management: removal of nonnatives, restoration of native grasses and scrub species, monitoring of the species, studies of response to fire, and studies and inventory of insect pollinators (Navy 2002, p. D–11). To date, multiple INRMP management strategies have been implemented for the conservation of *A. d.* var. *traskiae.* Other INRMP strategies that target the plant communities within which this species occurs include: Controlling erosion, with priority given to locations where erosion may be affecting listed species; producing a new vegetation map; reducing nonnative plant cover from 1992–1993 baseline levels; managing the size and intervals of fires; experimenting with fire management to improve native plant dominance while protecting sensitive plant occurrences; and conducting genetic and biological studies of *A. d.* var. *traskiae.*

The MOFMP, Erosion Control Plan, and nonnative plant species control conducted on the island are discussed above under *Acmispon dendroideus* var. *traskiae—Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.* Absent listing under the Act, the Navy would still be required to develop and implement INRMPs under the Sikes Act. However, as noted under the other factors, while the INRMP helps to ameliorate threats and provides some protection for *A. d.* var. *traskiae* occurrences, those occurrences within Impact Areas or operationally closed areas may not benefit from the conservation measures. While the INRMP has reduced the severity of threats and contributed to conservation of the species, it still allows for land use consistent with military readiness and training. Thus, Navy activities will continue to impact *A. d.* var. *traskiae* as described under Factor A.

State Protections

Since the time of listing, *Acmispon dendroideus* var. *traskiae* has benefited from additional State protections under the Native Plant Protection Act (NPPA) and California Endangered Species Act (CESA; listed 1982). However, the range of *A. d.* var. *traskiae* is restricted to a Federal military installation, so listing under NPPA and CESA may only afford protection to this species in rare instances when the lead agency is a

non-Federal agency or when proposed activities fall under other State laws.

Summary of Factor D

The regulatory mechanisms outlined above provide for adequate conservation of *Acmispon dendroideus* var. *traskiae.* In continuance of a long history of cooperative conservation efforts, the Navy also implements several conservation actions that benefit this plant taxon. The Navy has implemented a MOFMP to reduce the risk of fire on the island and a nonnative plant species control program. In response to the conservation actions proposed and the current status of the listed taxon, we issued a non-jeopardy biological opinion on the Navy's MOFMP. The provisions included in the San Clemente Island INRMP provide protection of *A. d.* var. *traskiae* occurrences and adaptive management of its habitat in order to help address threats to the plant from military activities and nonnative plants, although implementation may not be extended to occurrences in operationally closed areas. *A. d.* var. *traskiae* occurrences are afforded protection through Federal and military mechanisms, and thus the inadequacy of existing regulatory mechanisms is not considered a current threat to the species. However, in the absence of the Act, the existing regulatory mechanisms are not adequate to conserve *A. d.* var. *traskiae* throughout its range both now and in the future.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

The 1977 listing rule identified nonnatives as a threat to *Acmispon dendroideus* var. *traskiae* under Factor E (42 FR at 40684; August 11, 1977). In this 5-factor analysis, impacts from nonnative plants are discussed above under *Factor A* as a threat to habitat. Other threats attributable to Factor E that have been identified since listing include: (1) Movement of vehicles and troops, (2) fire, (3) climate change, and (4) hybridization. Factor E addresses threats to individuals of the species, rather than the habitat modification threats that are discussed in Factor A. Therefore, while some threats are discussed in both sections, in this section we are focusing on the direct impacts to individuals of *A. d.* var. *traskiae.*

Movement of Vehicles and Troops

Military training activities within SWAT, TAR, and the IOA often entail the movement of vehicles and troops over the landscape, which has the potential of trampling or crushing individual plants (for discussion of SWAT, TAR, and IOA, see above under *Malacothamnus clementinus—Factor E*). Based on the distribution of *Acmispon dendroideus* var. *traskiae* occurrences, and type of troop movements likely to occur, impacts due to trampling and crushing are considered a low-level threat to its long-term persistence, and are most likely to occur occasionally within the IOA and TAR. Approximately 13 of 29 occurrences (45 percent; Wilson Cove, Canchalagua Canyon, Middle Island Plateau, North Mosquito Cove, Eagle Canyon, Larkspur Canyon, Chamish Canyon, Lemon Tank Canyon, Seal Cove Terraces, Eel Cove Canyon, Middle Wallrock Canyon, Warren Canyon, and North Island Terraces) of *A. d.* var. *traskiae* are partially or wholly within the boundaries of a training area (IOA, TAR, or SWAT). Many of these occurrences are in areas that are not readily accessible to vehicles and troops. Loss of individual plants from proposed increases in troop and vehicle movements within SWAT, TAR, and the IOA is likely to increase, though this will not significantly impact the survival and recovery of this taxon because of the diffuse nature of this threat and the location of much of the species along the eastern escarpment, away from military training activities (USFWS 2008, pp. 113–122).

Fire

Although not specifically mentioned in the listing rule, intense or frequent fires threaten individuals at 14 of 29 (48 percent) of *Acmispon dendroideus* var. *traskiae* occurrences. In the *Factor A* discussion above, we addressed impacts of fire on the habitat. This section covers the discrete threat to individuals or occurrences of *A. d.* var. *traskiae.* As discussed in the Background section, it is unknown if *A. d.* var. *traskiae* is adapted to periodic fires, though it is likely that this taxon is resilient to occasional fires (Navy 2002, p. D–10; Tierra Data Inc. 2005, p. 80). Adult plants have been lost in fires, but subsequent recruitment from the seed bank resulted in replacement numbers of juvenile plants (Tierra Data Inc. 2005, p. 80). Aside from this observation, the relationship between fire and the life history of *A. d.* var. *traskiae* has not been adequately studied. Additionally, the species' tolerance to fire frequency is unknown. In areas that burn more frequently, the seed bank may become depleted if individuals burn before they produce seeds. Although an individual plant has the ability to produce vast amounts of seed, the seed bank must be replenished regularly for the species to persist (Junak and Wilken 1998, p. 257).

Acmispon dendroideus var. *traskiae* occurs in some areas of the island that may experience elevated fire frequency, such as in SHOBA and surrounding Eel Point (Eagle Canyon, Bryce Canyon, North Mosquito Cove, Canchalagua Canyon, Thirst Canyon, Cave Canyon, Horse Canyon, Pyramid Head, Seal Cove Terraces, and Eel Cove Canyon) (discussed in *A. d.* var. *traskiae—Factor A*). Increased fire frequency from intensified military use could also lead to localized changes in vegetation, resulting in indirect adverse effects on *A. d.* var. *traskiae.* The potential for frequent fire at many of the occurrences within SHOBA is reduced by their location on the eastern escarpment of the island, away from Impact Areas I and II. This threat may become difficult to assess with the recent closure of the eastern escarpment area due to unexploded ordnance. The Navy's fire management practices are anticipated to minimize frequency of ignitions as well as the spread of fires (as described above in *Factor A*).

The Navy conducts annual reviews of fire management and fire occurrence that allow for adaptive management. These measures should minimize loss of individuals or occurrences of *A. d.* var. *traskiae* due to fire. At the present time, fire management does not pose a threat as fuelbreak locations have not been proposed in the vicinity of this taxon. Although the Navy has planned and implemented fire management, fire threatens 14 occurrences of *Acmispon dendroideus* var. *traskiae*. Due to the continued impacts of fire within SHOBA, fire remains a Factor E threat to the existence of *A. d.* var. *traskiae*.

Climate Change

For general information regarding climate change impacts, see the climate change discussion under *Malacothamnus clementinus—Factor E* above. Since listing of *Acmispon dendroideus* var. *traskiae,* the potential impact of ongoing, accelerated climate change has become a recognized threat to the flora and fauna of the United States (IPCC 2007a, pp. 1–52; PRBO 2011, pp. 1–68). San Clemente is located in a Mediterranean climatic regime, but with a significant maritime influence. Climate change models indicate an increase in average temperature for southern California (see above discussion on climate change under *Malacothamnus clementinus—Factor E).* San Clemente Island typically receives less rainfall than neighboring mainland areas (Tierra Data Inc. 2005, p. 4). Therefore, the models may

understate the effects to vegetation on the island. Less rainfall and warmer air temperatures could limit the range of *A. d.* var. *traskiae,* although there is no direct research on the effects of climate change on the species. Additionally, changes in sea level and temperature may be more acute on small islands, due to their high vulnerability (surrounded by ocean) and low adaptive capacity (from limited size) (IPCC 2007b, p. 1). The impacts of future climate change to *A. d.* var. *traskiae* remain unclear. The most recent literature on climate change predicts hydrological changes, higher temperatures, and expansion of drought areas (IPCC 2007a, pp. 1–18). While we recognize that climate change is an important issue with potential effects to listed species and their habitats, the best available information does not facilitate accurate predictions regarding the effects to *A. d.* var. *traskiae* at this time.

Hybridization

As discussed above in the Background section, *Acmispon dendroideus* var. *traskiae* is known to hybridize with *Acmispon argophyllus* var. *argenteus*. In 1990, Liston *et al.* (p. 240) confirmed hybridization between co-occurring populations of *A. d.* var. *traskiae* and *A. argophyllus* var. *argenteus* in Wilson Cove. At that time, they detected only four hybrid individuals out of 38 individuals tested, and failed to detect hybridization in another area of co-occurrence at the southern end of the island. Although hybrid individuals seem to be restricted to Wilson Cove (Liston 1990, p. 240; Allan 1999, p. 91), other unconfirmed hybrids (no genetic testing done) have been observed elsewhere on the island (Howe 2009b, pers. comm.; Braswell 2011, pers. obs.).

Liston *et al.* (1990, pp. 240–243) offered three hypotheses for the scarcity of confirmed hybrid individuals. First, hybrids may have reduced fitness and be selected against, or be sterile and thus unable to produce viable seed even if backcrossed to the parent taxa. In this situation, hybridization would not be a threat to the genetic integrity of *A. dendroideus* var. *traskiae*. Second and conversely, if the fertile hybrids are recent in origin (within the last 20 years), and because both parental taxon are long-lived, woody perennials, few hybrid individuals would be expected due to the slower development and lifespan of the species. If this is correct, the genetic integrity of the largest-known occurrence of *A. d.* var. *traskiae* in Wilson Cove might be at risk of introgressive hybridization (introduction of genes from one species to another resulting in fertile hybrids). Introgressive hybridization could lead to the loss of genetic variation and lower fitness of *A. d.* var. *traskiae*. Finally, the limited number of hybrid plants (four) might be an artifact of the genetic testing method used by the study.

Liston *et al.* (1990, p. 243) suggested that there be further investigation of these hypotheses before management recommendations are made to the Navy. Allan (1999, p. 91) stated that *A. d.* var. *traskiae* should be ''closely monitored.'' Although the species has expanded its range and numbers, hybridization with *A. a.* var. *argenteus* remains a concern at the largest of the 29 occurrences (Wilson's Cove), although unconfirmed hybrids have been observed in other areas of the island (e.g., Norton Canyon). Hybridization may threaten, and could diminish, the genetic diversity of the species, especially in the already disturbed occurrence of Wilson Cove (Allan 1999, pp. 91–92). Additional study is needed to determine the extent and magnitude of this threat to *A. d.* var. *traskiae*.

Summary of Factor E

Threats associated with military activities, fire, climate change, and hybridization continue to impact *Acmispon dendroideus* var. *traskiae* at 18 of 29 occurrences (62 percent; Wilson Cove, Canchalagua Canyon, Middle Island Plateau, North Mosquito Cove, Eagle Canyon, Larkspur Canyon, Chamish Canyon, Lemon Tank Canyon, Seal Cove Terraces, Eel Cove Canyon, Middle Wallrock Canyon, Warren Canyon, North Island Terraces, Bryce Canyon, Thirst Canyon, Cave Canyon, Horse Canyon, and Pyramid Head) on San Clemente Island. Trampling and crushing of individual plants are probably incidental, but are likely to increase with increases in training levels on the island. However, the Navy is implementing conservation measures that will improve conditions for *A. d.* var. *traskiae,* which has expanded its distribution on the island. Military training activities have the potential to ignite fires that can spread to habitat supporting this species, though the majority of the occurrences are outside of the areas designated for live fire and demolition. In preparation for these training efforts, the Navy implemented a fire management plan within the MOFMP that will limit the frequency of fires escaping the Impact Areas.

Climate change may also likely impact *Acmispon dendroideus* var. *traskiae,* though the magnitude of this threat is largely unknown. The genetic integrity of *A. d.* var. *traskiae* may be threatened by hybridization with *A. adsurgens* var. *argenteus* at one of the largest occurrences and requires further investigation. However, the extent and prevalence of this threat is unknown, and only confirmed in one of 29 occurrences. Overall, the threats described under Factor E are either of low magnitude, low likelihood, or adequately managed, while the potential overall threat of climate change remains unknown across this taxon's range. Although these threats could directly impact individuals of this taxon, we are of the view that they will not impede the recovery of *A. d.* var. *traskiae* now or in the future.

Combination of Factors—Acmispon dendroideus var. traskiae

A species may be affected by more than one threat in combination. Within the preceding review of the five listing factors, we have identified multiple threats that may have interrelated impacts on the species (see also above discussion on combination of factors—*Malacothamnus clementinus*). The species' productivity may be reduced because of these threats, either singularly or in combination. However, it is not necessarily easy to determine (nor is it necessarily determinable) whether a particular threat is the primary threat having the greatest effect on the viability of the species, or whether it is exacerbated by or working in combination with other potential threats to have cumulative or synergistic effects on the species. While the combination of factors is a threat to the existence of *Acmispon dendroideus* var. *traskiae,* we are unable to determine the magnitude or extent of cumulative or synergistic effects of the combination of factors on the viability of the species at this time.

Castilleja grisea (San Clemente Island Paintbrush)

In the 2007 status review, we stated that the predominant threat at listing (nonnative herbivores) was removed from San Clemente Island in 1992 (USFWS 2007c, pp. 1–19). Additional threats to *Castilleja grisea* identified in 2007 include: (1) Erosion, (2) nonnative species, (3) fire, (4) land use, and (5) access to SHOBA. The first four of these threats are discussed below under *Factor A.* As discussed previously, access to SHOBA is not considered a threat, though it limits our ability to assess all occurrences of the taxon reviewed here.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Their Habitat or Range

Under this listing factor in the final listing rule, we identified habitat modification by browsing feral goats

and rooting feral pigs as threats to *Castilleja grisea* and other island taxa (42 FR 40682). As discussed above, the Navy removed the last of the remaining feral goats and pigs from San Clemente Island in 1992 (Kellogg and Kellogg 1994, p. 5), which resulted in improved habitat conditions, and led to changes in the cover of native and nonnative plants on the island (Tierra Data Inc. 2005, pp. i–96; Kellogg 2006, pers. comm.). The Recovery Plan identified habitat alteration and disturbance from the Navy's use of the island for military operational and training needs as additional threats to the habitats occupied by *C. grisea* (USFWS 1984, pp. 58–63). Additional threats identified since listing include alteration of San Clemente Island habitats by military training activities, fire, and fire management. As outlined below, we discuss the impacts of the following threats that affect the habitat or range of *C. grisea:* (1) Land use, (2) erosion, (3) nonnative plants, (4) fire, and (5) fire management.

Land Use

The distribution of *Castilleja grisea* includes a single occurrence in the north of the island at West Cove, with the remaining 28 occurrences distributed across the southern 15.5 mi (25 km) of the island, particularly along the eastern escarpment. Training activities approved in the MOFMP would include substantial increases in vehicle and foot traffic in the IOA, leading to habitat modification. Ten of the 29 occurrences (34 percent; plain northeast of Warren Canyon, Larkspur Canyon, Lemon Tank Canyon, Eagle Canyon, Bryce Canyon, Horse Beach Canyon, China Canyon, Knob Canyon, Canchalagua Canyon, and Pyramid Head) are within or partially within the IOA and experience direct habitat impacts, while three of 29 occurrences (10 percent; Thirst Canyon, SHOBA Boundary Occurrence, and Upper Horse Canyon) are near the IOA (within 1,000 ft (305 m)) and could experience diffuse or accidental impacts to *C. grisea* habitat. Recent area closures due to unexploded ordnance could make habitat impacts from training difficult to assess for several occurrences (34 percent; Nanny Canyon, Lemon Tank Canyon, Eel Point, Eagle Canyon, Bryce Canyon, Horse Beach Canyon, China Canyon, Knob Canyon, Canchalagua Canyon, and Pyramid Head) in the future. Additionally, one occurrence (West Cove) is within an Assault Vehicle Maneuver Area (AVMA) and could be subject to habitat disturbance from vehicles.

The southern portion of *Castilleja grisea*'s distribution extends through SHOBA where impacts to the habitat are likely. Certain munitions exercises involve the use of incendiary devices, such as illumination rounds, white phosphorous, and tracer rounds, which pose a high risk of fire ignition (USFWS 2008, p. 11–13). Because of the elevated risk of fire associated with training activities, live and inert munitions fire are targeted towards Impact Areas I and II within SHOBA where bombardments and land demolition are concentrated. Four of 29 occurrences (14 percent; China Canyon, Red Canyon, Upper Chenetti Canyon and Horse Beach Canyon) are within or partially within Impact Areas. Currently, the Impact Areas are closed to nonmilitary personnel, so the plant's status at these four occurrences is unknown, as well as the status of any conservation action that would otherwise be expected to be implemented in these areas (USFWS 2008, p. 50).

Also within SHOBA, an occurrence of *C. grisea* is located in lower Horse Beach Canyon, above Horse Beach. Horse Beach (TAR 21) is used for special warfare training activities that include the use of live fire, illumination rounds, and tracers. Training activities within parts of SHOBA pose a direct threat to habitat due to associated ground disturbance and land demolition. Sixteen of 29 *C. grisea* occurrences (55 percent) are located outside of heavily impacted training areas, and 13 occurrences (45 percent; West Cove, Plain northeast of Warren Canyon, Larkspur Canyon, Lemon Tank Canyon, Eagle Canyon, Bryce Canyon, China Canyon, Knob Canyon, Canchalagua Canyon, Pyramid Head, Red Canyon, Upper Chenetti Canyon and Horse Beach Canyon) are at least partially within the boundaries of a training area (IOA, TAR, AVMA, or Impact Area). Although, within training areas, many of the impacts to these 13 occurrences would be diffuse and are unlikely to have a high impact on the species. The Navy has demonstrated their efforts to help conserve and manage listed species on the island through amelioration of habitat impacts by military activities through implementation of the MOFMP and INRMP. Land use appears to pose a high-magnitude threat to the habitat of a small number of occurrences of *C. grisea* on San Clemente Island.

Erosion

Erosion and associated soil loss caused by browsing of feral goats and rooting of feral pigs likely modified the island's habitat (Navy 2002, p. 1–14). Defoliation from overgrazing on San Clemente Island resulted in increased erosion over much of the island, especially on steep slopes where denuded soils can be quickly washed away during storm events (Johnson 1980, p. 107; Navy 2002, pp. 1–14, 3–9; Tierra Data Inc. 2007, pp. 6–7). There may be residual impacts from historical grazing, and vegetation may be slow to recover and hold soil. In the INRMP, erosion was identified as a threat to the canyon woodland habitat and maritime desert scrub, which is habitat for *Castilleja grisea* (Navy 2002, pp. 4–3, 4–12). The process of soil erosion can lead to destruction of terraces, steep slopes, and canyons that support the growth and reproduction of *C. grisea*. *Castilleja grisea* plants occur within steep canyon areas where such concentration of water flows may be a threat (Navy 2002, p. D–23).

Increased military activities where *Castilleja grisea* occurs within training area boundaries are expected to increase erosion associated with roadways, through soil compaction and other soil disturbances. The impacts from erosion are anticipated along the ridgeline of the eastern escarpment, affecting eight occurrences (Pyramid Head, Knob Canyon, Canchalagua Canyon, Bryce Canyon, Eagle Canyon, Thirst Canyon, SHOBA Boundary occurrence, and Horton Canyon) (Tierra Data Inc 2007, pp.12–18; Navy 2008a, p. G–8). Closure of the eastern escarpment within SHOBA due to unexploded ordnance could make assessing this threat and implementing conservation measures in these eight occurrences difficult in the future.

The Navy studied the potential for erosion from several proposed military activities (Tierra Data Inc. 2007, pp. 1–45, Appendices). Approximately 13 of 29 *Castilleja grisea* occurrences (45 percent; West Cove, Plain northeast of Warren Canyon, Larkspur Canyon, Lemon Tank Canyon, Eagle Canyon, Bryce Canyon, China Canyon, Knob Canyon, Canchalagua Canyon, Pyramid Head, Red Canyon, Upper Chenetti Canyon, and Horse Beach Canyon) fall partially or wholly within the boundaries of a designated training area (IOA, TAR, AVMA, or Impact Area), and are likely to be impacted by erosion. Fifteen occurrences of *C. grisea* are at least partially within 500 ft (152 m) of a road (paved or unpaved) (China Canyon, Horse Beach Canyon, Pyramid Head, Knob Canyon, Canchalagua Canyon, Bryce Canyon, Eagle Canyon, Upper Horse Canyon, Plain northeast of Warren Canyon, Horton Canyon, Seal Cove Terraces, Lemon Tank Canyon, Larkspur Canyon, Terrace Canyon, and West Cove) (Forman and Alexander

1998, p. 217). These occurrences could be subject to diffuse disturbance and road effects that degrade the habitat quality. Roads can concentrate water flow, causing incised channels and erosion of slopes (Forman and Alexander 1998, pp. 216–217). This increased erosion near roads can degrade habitat, especially along the steep canyons and ridges.

Along the eastern escarpment, *Castilleja grisea* is found in steep canyons in proximity to roads where it may be vulnerable to runoff during storm events (Navy 2008a, pp. G–4, G–8). At the southern end of the species' range, one occurrence is downslope from Horse Beach Canyon Road along a poorly maintained dirt road that is proposed to serve as part of the Assault Vehicle Maneuver Corridor. This location is likely to have an elevated risk from erosion (USFWS 2008, p. 99).

The Navy incorporates erosion control measures into all site feasibility studies and project design to minimize the potential to exacerbate existing erosion and avoid impacts to listed species (Munson 2011a, pers. comm.). The INRMP requires that all projects include erosion conservation work (Navy 2002, p. 4–89). These conservation actions include best management practices, choosing sites that are capable of sustaining disturbance with minimum soil erosion, and stabilizing disturbed sites (Navy 2002, pp. 4–89–4–91). An erosion control plan for San Clemente Island is in the development stage, with expectations to reduce impacts of erosion where *Castilleja grisea* occurs in areas with increased and expanded military operations (Munson 2011a, pers. comm.). This erosion control plan will address military operations associated with the IOA, AVMA and AFP; however, since the plan is not yet finalized, it does not currently ameliorate the noted threats from erosion.

In areas that will not be covered under the erosion control plan, erosion control measures are already being incorporated into project designs to minimize the potential to exacerbate existing erosion and avoid impacts to listed species (Munson 2011a, pers. comm.). Additionally, large-scale island-wide maneuvers with assault vehicles have been postponed until the erosion control plan is enacted. The processes and results of erosion are island-wide threats to *C. grisea,* particularly to the occurrences in or adjacent to military training areas or roads. Seventeen of 29 occurrences (55 percent; West Cove, Plain northeast of Warren Canyon, Larkspur Canyon, Lemon Tank Canyon, Eagle Canyon, Bryce Canyon, China Canyon, Knob Canyon, Canchalagua Canyon, Pyramid Head, Red Canyon, Upper Chenetti Canyon, Horse Beach Canyon, Upper Horse Canyon, Horton Canyon, Seal Cove Terraces, and Terrace Canyon) of *C. grisea* are in areas that could be subject to, and threatened by, erosion from training activities or road use. Occurrences in operationally closed areas may not be afforded the conservation measures outlined by the Navy.

Erosion can lead to overall habitat degradation and loss of individuals or groupings of plants. However, despite existing levels of erosion on the island, the distribution of *Castilleja grisea* has increased since listing. The Navy incorporates erosion control measures into all projects to minimize the potential to exacerbate existing erosion and avoid impacts to habitat and listed species. Although the Navy tries to ameliorate erosion, management efforts are not possible in areas that are closed to natural resource personnel. The processes and results of erosion are island-wide threats to *C. grisea,* particularly to the 17 occurrences in or adjacent to military training areas or roads. Therefore, erosion is still considered a threat to the existence of *C. grisea.*

Nonnative Plants

One of the threats to *Castilleja grisea* identified in the final listing rule was the spread of nonnative plants into its habitat (42 FR 40682, 40684). Nonnatives can alter habitat structure, ecological processes such as fire regimes, nutrient cycling, hydrology, and energy budgets, and compete for water, space, light, and nutrients (for discussion of nonnatives on San Clemente Island, see above discussion on Nonnative Species under *Malacothamnus clementine—Factor A*). *Castilleja grisea* is often associated with native maritime desert scrub vegetation types, where nonnative grasses are present but not a dominant component of the plant community (Tierra Data Inc. 2005, pp. 29–42).

Although previous invasions of nonnative species were probably introduced in grazing fodder, current invasions are typically introduced and spread around the island by military activities and training (see above discussion on Nonnative Species under *Malacothamnus clementinus—Factor A*). Nonnative plants constitute a rangewide threat to all native plants on San Clemente Island, including all occurrences of *Castilleja grisea.* A total of 9 of 29 occurrences (31 percent; China Canyon, Horse Beach Canyon, Pyramid Head, Knob Canyon, Canchalagua Canyon, Bryce Canyon, Eagle Canyon, Plain northeast of Warren Canyon, and Lemon Tank Canyon) are within 500 ft (152 m) of Ridge Road or China Point Road, and may be subject to diffuse disturbance and road effects that degrade the habitat quality along the road (Forman and Alexander 1998, p. 217). Roadsides tend to create conditions (high disturbance, seed dispersal from vehicles, ample light and water) preferred by nonnative species (Forman and Alexander 1998, p. 210). Nonnatives, including *Foeniculum vulgare* and *Mesembryanthemum crystallinum* (crystalline iceplant), have been found in the disturbed shoulders along the road between Ridge Road and China Point in SHOBA (Braswell 2011, pers. obs.).

Potential impacts from nonnative plants are expected to be minimized by annual implementation of the Navy's island-wide nonnative plant control program (O'Connor 2009b, pers. comm.; Munson 2011a, pers. comm.; see above discussion on Nonnative Species under *Malacothamnus clementine—Factor A*). This program targets nonnative species for elimination using herbicide and mechanical removal, prioritizing species that are new to the island or are particularly destructive. The program has been successful at isolating and limiting some species, such as *Foeniculum vulgare,* to a few locations (Howe 2011b, pers. comm.). To reduce the potential for transport of nonnative plants to San Clemente Island, military and nonmilitary personnel inspect tactical ground vehicles, and remove any visible plant material, dirt, or mud prior to going onto the island (USFWS 2008, p. 63). This precaution helps to control the movement of nonnative plants onto the island, but once on the island nonnatives are easily spread by the movement of vehicles from one area to another. Although nonnative plants will continue to pose a rangewide risk to *C. grisea,* it is a threat of low intensity, and the Navy has taken steps to curtail habitat conversion from nonnative plants.

Nonnative plant species are an island-wide threat to the native vegetative community. The Navy has taken preventative and conservation measures through funding and implementing nonnative plant species control on the island. Management and control of nonnative plants is not in place at the four occurrences (14 percent; China Canyon, Red Canyon, Upper Chenetti Canyon, and Horse Beach Canyon) that are closed to natural resource managers. However, outside of these areas, *Castilleja grisea* has persisted on the

island. Despite the continued risk of encroachment by nonnatives, *Castilleja grisea* remains on the island, and its range has continued to expand. Impacts from nonnative plants are a persistent, but low-level, threat to *C. grisea* habitat.

Fire

Fire was not considered a threat to *Castilleja grisea* habitat at the time of listing (42 FR 40682; August 11, 1977). Since that time, however, over 50 percent of the island has experienced at least one wildfire (Navy 2002, Map 3–3, p. 3–32). The majority of fires are concentrated in SHOBA, potentially impacting 15 of 29 occurrences (52 percent; Thirst Canyon, Eagle Canyon, Bryce Canyon, Canchalagua Canyon, Knob Canyon, Pyramid Head, Snake Canyon, Upper Chenetti Canyon, Horse Beach Canyon, China Canyon, Red Canyon, Kinkipar Canyon, Cave Canyon, Horse Canyon, and Upper Horse Canyon). Seven occurrences occur within the eastern escarpment in SHOBA (Thirst Canyon, Eagle Canyon, Bryce Canyon, Canchalagua Canyon, Knob Canyon, Pyramid Head, and Snake Canyon), where impacts from fire are less likely. Recent closure of this area limits the ability to assess the status and manage habitat at these occurrences.

Because of the elevated risk of fire associated with training activities, live and inert munitions fire is targeted towards two delineated Impact Areas. The risk of frequent fire is higher in Impact Areas I and II, potentially affecting the habitat at four of 29 occurrences (14 percent; Upper Chenetti Canyon, Horse Beach Canyon, China Canyon, and Red Canyon). The effects of fire, and the state of plants within the Impact Areas, are currently unknown due to closure of the area (USFWS 2008, p. 50). Fires are occasionally ignited by activities north of SHOBA, posing a low-magnitude threat to the habitat at 14 of the 29 occurrences (48 percent; SHOBA Boundary, Horton Canyon, Lemon Tank Canyon, Nanny Canyon, Larkspur Canyon, Box Canyon, Upper Norton Canyon, Middle Ranch Canyon, Waymuck Canyon, Plain northeast of Warren Canyon, Seal Cove Terraces, Eel Cove Canyon, Terrace Canyon, and West Cove) (Navy 2002, Map 3–4, p. 3–33).

Increased fire frequency from intensified military use could lead to localized changes in vegetation (see above discussion on fire frequency under *Malacothamnus clementinus—Factor A*). The Navy has significantly expanded the number of locations where live fire and demolition training will take place (USFWS 2008, pp. 21–37), including TAR north of SHOBA (TAR 17—Eel Cove Canyon and Seal Cove Terraces, and TAR 14 and 15—Larkspur Canyon). In addition to demolitions, certain proposed munitions exercises involve the use of incendiary devices, such as illumination rounds, white phosphorous, and tracer rounds, which pose a high risk of fire ignition. Expanded live fire and demolition training is also approved within TAR 16 (Lemon Tank Canyon) toward the center of the island. It is likely that the fire pattern on the island will change due to this increase in ignition sources, with fires becoming more common within and adjoining the training areas north of SHOBA.

At the time of listing, fire was not identified as a threat because of lack of fire history and the low intensity of military training on the island. Since that time, military training has significantly increased, and we have better records of the fire frequency on the island. Approximately 19 of 29 occurrences (65 percent) of *Castilleja grisea* fall within areas that may be subject to recurrent fires associated with military training. This includes locations that fall within SHOBA that serve as a buffer for Impact Areas I and II, and occurrences near live fire and demolition training areas. As described in the Background section, occurrences of *C. grisea* have been discovered within and outside of the impact areas in SHOBA (Junak and Wilken 1998, p. 298; Navy 2002, p. D–20), indicating that the species is tolerant of at least occasional fire. High fire frequency may be a potential threat that could limit the distribution of *C. grisea* by overwhelming its tolerance threshold (Brooks *et al.* 2004, p. 683; Jacobson *et al.* 2004, p. 1). Frequent fire may exceed a plant taxon's capacity to persist by depleting seed banks and reducing reproductive output when fire occurs at higher than natural frequencies in *C. grisea* habitat (Zedler *et al.* 1983, pp. 811–815).

Within the Impact Areas or operationally closed zones, fire suppression and firefighting are not being implemented because of safety hazards from the presence of unexploded ordnance. Fires that escape designated training areas threaten other parts of the island, though it is unlikely that one fire is capable of spreading throughout the entire range of the species due to its broad distribution across the island. The Navy's implementation of the MOFMP will limit the frequency with which fires escape Impact Areas and TAR. Through the annual review process, the Navy will identify mechanisms to reduce fire return intervals within areas and habitats where this taxon is concentrated (USFWS 2008, pp. 91–122). Although the threat is ameliorated through the MOFMP, fire remains an island-wide threat to *C. grisea,* particularly to the habitat at the 19 occurrences that fall within areas that may be subject to recurrent fire associated with military training.

Fire Management

A fire management plan within the MOFMP was developed by the Navy to provide flexibility for the timing of military training and to ensure that adequate fire suppression resources were present with an increased level of training activities (see above discussion on Fire Management under *Malacothamnus clementinus—Factor A).* The Navy constructed fuelbreaks around the Impact Areas for safety purposes and to manage the spread of fire from the Impact Areas. Maintenance of these fuelbreaks reduces the likelihood and frequency of fires spreading to sensitive areas and habitats, such as those occupied by *Castilleja grisea.* Fuelbreaks on San Clemente Island are created using herbicides and strip burning, and maintained using herbicides and fire retardant (Phos-Chek D75F) (USFWS 2008, pp. 97–98) (see above discussion on Fire Management (including fire retardant use) under *Malacothamnus clementinus—Factor A*).

Four occurrences (Red Canyon, China Canyon, Horse Beach Canyon, and Upper Chenetti Canyon) of *C. grisea* have been documented within the Impact Areas, and are likely exposed to impacts from higher intensity training, such as bombardment and fire. Some of these occurrences are near fuelbreaks and may be impacted by a change in the vegetation community from fuelbreak maintenance, resulting in an increase in erosion or invasive nonnative plants. Additionally, occurrences on the eastern escarpment near the firebreaks on Ridge Road (Canchalagua Canyon, Knob Canyon) might be impacted by the creation and maintenance of firebreaks (USFWS 2008, p. 57). The Navy has committed to studying the effects of Phos-Chek on San Clemente Island vegetation, and has avoided application of Phos-Chek within 300 ft (91.4 m) of mapped listed species to the extent allowable with fuelbreak installation (USFWS 2008, pp. 97–98). In the MOFMP, the Navy committed to conducting preseason briefings for firefighting personnel on the guidelines for fire suppression and limitations associated with the use of Phos-Chek and saltwater drops (USFWS 2008, pp. 97–98). The impact of saltwater on the habitat of *C. grisea* has not yet been

assessed. However, if salt persists, the composition in the plant community could change to favor more salt-tolerant taxa.

It is anticipated that the Navy will construct additional fuelbreaks to minimize the risk of fire spreading from areas proposed for expansion of live fire and demolition training north of SHOBA (USFWS 2008, p. 98). To minimize the potential for effects to listed species, the Navy considers the documented locations of listed species on the island as fuelbreak lines are developed. The majority of *Castilleja grisea* habitat is not impacted by fire management, and only 6 of 29 occurrences (21 percent) are associated with fuelbreaks. Even if expanded in conjunction with increased levels of training activities, the benefits of fuelbreaks outweigh the detrimental impacts of recurrent fire to *C. grisea* habitat. The threat of fire management to *C. grisea* habitat is restricted mainly to occurrences within SHOBA, and particularly to occurrences in the Impact Areas. Because of the isolated nature of this threat and its role in prevention of fire, fire management is a low-magnitude threat to *C. grisea* in the future.

Summary of Factor A

The habitat of *Castilleja grisea* is threatened by destruction and modification of habitat associated with land use, erosion, the spread of nonnatives, fire, and fire management. To help ameliorate these threats, the Navy is implementing a MOFMP, an INRMP, and the island-wide control of nonnative plants. (Navy 2002, pp. 1–1—8–12; USFWS 2008, pp. 1–237). The MOFMP has been helpful in informing strategic decisions for training using live fire or incendiary devices. The Navy has postponed major troop and assault vehicle maneuvers across the island until an erosion control plan is completed (Navy 2008b, pp. 5–29, 5–30; USFWS 2008, pp. 62, 87). Natural resource managers have been successful at decreasing the prevalence of particularly destructive nonnatives, such as *Foeniculum vulgare.* In recent years, access to Impact Areas I and II within SHOBA for biological monitoring and conservation actions has been strictly prohibited (USFWS 2008, p. 50), so the status of four occurrences (Red Canyon, China Canyon, Horse Beach Canyon, and Upper Chenetti Canyon) remains unknown. Recently, closures along the eastern escarpment in SHOBA have also limited the monitoring and management of four occurrences (Knob Canyon, Canchalagua Canyon, Bryce Canyon, and Eagle Canyon). However, 16 of 29 occurrences (55 percent) of *C. grisea* fall outside Impact Areas, IOA, AVMA, TAR, and fuelbreaks, where the most intensive habitat disturbances are likely to take place. While it is anticipated that military training activities will likely increase, based on the current range of *C. grisea* and conservation efforts, the threats to the habitat of *C. grisea* posed by land use, erosion, nonnatives, fire and fire management are decreasing in magnitude.

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

In the listing rule (42 FR 40682; August 11, 1977), the Service did not identify any threats from overutilization, and there is no new information to indicate that overutilization is a threat to *Castilleja grisea.* Although voucher herbarium specimens of *C. grisea* and seeds have been collected for research and seed banking, overutilization of *C. grisea* for any purpose is not currently considered a threat nor expected to be in the future.

Factor C. Disease or Predation

Grazing of feral goats and rooting of feral pigs were considered a direct threat to *Castilleja grisea* in the final listing rule (42 FR 40682; August 11, 1977). As stated above, this threat was ameliorated by the removal of all goats and pigs from San Clemente Island in 1992, as recognized in our 2007 status review (USFWS 2007c, p. 11). Currently, no other predators or diseases on San Clemente Island are known to pose a significant threat to *C. grisea,* nor are they expected to become a threat in the future.

Factor D. Inadequacy of Existing Regulatory Mechanisms

The Act requires us to examine the adequacy of existing regulatory mechanisms with respect to those existing and foreseeable threats that may affect *Castilleja grisea.* The inadequacy of existing regulatory mechanisms was not indicated as a threat to *C. grisea* at listing (42 FR 40682; August 11, 1977). Since it was listed as endangered, the Act has been and continues to be the primary Federal law that affords protection to *C. grisea.* The Service's responsibilities in administering the Act include sections 7, 9, and 10 (for more information on the Service's responsibilities, see above discussion under *Malacothamnus clementinus—Factor D*). Critical habitat has not been designated or proposed for this taxon. Listing *C. grisea* provided a variety of protections, including the prohibitions against removing or destroying plants within areas under Federal jurisdiction and the conservation mandates of section 7 for all Federal agencies. If *C. grisea* were not listed, these protections would not be provided. Thus, we must evaluate whether other regulatory mechanisms would provide adequate protections absent the protections of the Act.

Other Federal Protections

National Environmental Policy Act (NEPA)

All Federal agencies are required to adhere to the National Environmental Policy Act (NEPA) of 1970 (42 U.S.C. 4321 *et seq.*) for projects they fund, authorize, or carry out. The Council on Environmental Quality's regulations for implementing NEPA (40 CFR parts 1500–1518) state that agencies shall include a discussion on the environmental impacts of the various project alternatives (including the proposed action), any adverse environmental effects that cannot be avoided, and any irreversible or irretrievable commitments of resources involved (40 CFR part 1502). The NEPA itself is a disclosure law, and does not require subsequent minimization or mitigation measures by the Federal agency involved. Although Federal agencies may include conservation measures for *Castilleja grisea* as a result of the NEPA process, any such measures are typically voluntary in nature and are not required by the statute. NEPA does not itself regulate activities that might affect *C. grisea,* but it does require full evaluation and disclosure of information regarding the effects of contemplated Federal actions on sensitive species and their habitats.

On San Clemente Island, the Navy must meet the NEPA requirements for actions significantly affecting the quality of the human environment. Typically, the Navy prepares Environmental Assessments and Environmental Impact Statement on operational plans and new or expanding training actions. Absent the listing of *Castilleja grisea,* we would expect the Navy to continue to meet the procedural requirements of NEPA for its actions, including evaluating the environmental impacts to rare plant species and other natural resources. However, as explained above, NEPA does not itself regulate activities that might affect *C. grisea.*

Sikes Act Improvement Act (Sikes Act)

The Sikes Act (16 U.S.C. 670) authorizes the Secretary of Defense to develop cooperative plans with the

Secretaries of Agriculture and the Interior for natural resources on public lands. The Sikes Act Improvement Act of 1997 requires Department of Defense installations to prepare INRMPs that provide for the conservation and rehabilitation of natural resources on military lands consistent with the use of military installations to ensure the readiness of the Armed Forces. An INRMP is a plan intended ''* * * to guide installation commanders in managing their natural resources in a manner that is consistent with the sustainability of those resources while ensuring continued support of the military mission'' (Navy 2002, p. 1–1). INRMPs are developed in coordination with the State and the Service, and are generally updated every 5 years. Although an INRMP is technically not a regulatory mechanism because its implementation is subject to funding availability, it is an important guiding document that helps to integrate the military's mission with natural resource protection.

San Clemente Island Integrated Natural Resources Management Plan (INRMP)

Pursuant to the Sikes Act, the Navy adopted an INRMP for San Clemente Island that identifies multiple objectives for protecting *Castilleja grisea* and its habitat to help reduce threats to this taxon (Navy 2002). The INRMP also disclosed actions through the NEPA process, and to comply with such legislation and regulations as the Endangered Species Act, the Federal Noxious Weed Act of 1974 (7 U.S.C. 2801), the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601), the Resources Conservation and Recovery Act (42 U.S.C. 6901), and the Soil Conservation Act (16 U.S.C. 3B) (see INRMP section above under *Malacothamnus clementinus—Factor D).* Natural resource objectives of relevance to the protection of *C. grisea* in the INRMP include an objective to: ''Protect, monitor, and restore plants and cryptograms in order to manage for their long-term sustainability on the island'' (Navy 2002, p. 4–39). The INRMP specifically includes the following objectives for *C. grisea* management: recovery of native shrub communities that are host plants for the species, the removal of nonnatives, monitoring of the species, studies of preferred host plants, study of plant's response to fire, and studies and inventory of insect pollinators (Navy 2002, pp. D–20, D–21). Multiple INRMP management strategies have been implemented for the conservation of *C. grisea.* Other INRMP strategies that target the plant communities within which this species occurs include: Controlling erosion, with priority given to locations where erosion may be affecting listed species; producing a new vegetation map; reducing nonnative plant cover from 1992–1993 baseline levels; managing the size and intervals of fires; experimenting with fire management to improve native plant dominance while protecting sensitive plant occurrences; and conducting genetic and biological studies of *C. grisea* across the island.

The MOFMP, Erosion Control Plan, and nonnative plant species control conducted on the island are discussed above under *Castilleja grisea—Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.* Absent listing under the Act, the Navy would still be required to develop and implement INRMPs under the Sikes Act. However, as noted under the other factors, while the INRMP helps to ameliorate threats and provides some protection for *C. grisea* occurrences, those occurrences within Impact Areas or operationally closed areas may not benefit from the conservation measures. While the INRMP has reduced the severity of threats and contributed to conservation of the species, it still allows for land use consistent with military readiness and training. Thus, Navy activities will continue to impact *C. grisea* as described under Factor A and E.

State Protections

Since the time of listing, *Castilleja grisea* has benefited from additional State protections under the Native Plant Protection Act (NPPA) and California Endangered Species Act (CESA; listed 1982). However, the range of *C. grisea* is restricted to a Federal military installation, so listing under NPPA and CESA may only afford protection to this species in rare instances when the lead agency is a non-Federal agency or when proposed activities fall under other State laws.

Summary of Factor D

The regulatory mechanisms outlined above provide for adequate conservation of *Castilleja grisea.* In continuance of a long history of cooperative conservation efforts, the Navy also implemented several conservation actions that benefit this plant taxon. The Navy has implemented an MOFMP to reduce the risk of fire on the island and a nonnative plant species control program. In response to the conservation actions proposed and the current status of the listed taxon, we issued a non-jeopardy biological opinion on the Navy's MOFMP. The provisions included in the San Clemente Island INRMP provide protection to all *C. grisea* occurrences and adaptive management of its habitat in order to help address threats to the plant from military activities and nonnative plants. However, as indicated in the discussion under Factor A, not all management tools described in the INRMP are in place, and conservation management may not be implemented at several of the known occurrences that have been closed to natural resource managers. *Castilleja grisea* occurrences are afforded protection through Federal and military mechanisms, and thus the inadequacy of existing regulatory mechanisms is not considered a threat to the species now or in the future. However, in the absence of the Act, the existing regulatory mechanisms are not adequate to conserve *C. grisea* throughout its range both now and in the future.

Factor E. Other Natural or Manmade Factors Affecting Their Continued Existence

The 1977 listing rule identified nonnatives as a threat to *Castilleja grisea* under *Factor E:* competition from nonnative plants (42 FR 40682; August 11, 1977). In this 5-factor analysis, impacts from nonnative plants are discussed above under *Factor A* as a threat to habitat. Other Factor E threats identified since listing that currently impact *C. grisea* plants include: (1) Movement of vehicles and troops, (2) fire, and (3) climate change. Factor E addresses threats to individuals of the species, rather than the habitat modification threats that are discussed in Factor A. Therefore, while some threats are discussed in both sections, in this section we are focusing on the direct impacts to individuals of *C. grisea.*

Movement of Vehicles and Troops

Military training activities within training areas often entail the movement of vehicles and troops over the landscape with the potential of trampling or crushing individual plants (for discussion of SWAT, TAR, and IOA, see above discussion for *Malacothamnus clementinus—Factor E*). Based on the distribution of *Castilleja grisea* occurrences and type of troop movements likely to occur, impacts due to trampling and crushing are likely to occur within the IOA or AVMA, along roads, and in the Impact Areas. Specifically, major troop movements and vehicle landings are planned through Horse Beach and the Horse Beach Canyon occurrence, with troops and assault vehicles moving

north along Horse Beach Road from the beach (USFWS 2008, pp. 30, 41). These operations could affect the Horse Beach Canyon and China Canyon occurrences (USFWS 2008, pp. 85–86). The status of these plants is currently unknown because of closure of the Impact Areas (USFWS 2008, p. 50).

Sixteen of 29 occurrences (approximately 55 percent; West Cove, Terrace Canyon, Larkspur Canyon, Nanny Canyon, Lemon Tank Canyon, Seal Cove Canyon, Eel Cove Canyon, Plain northeast of Warren Canyon, Eagle Canyon, Bryce Canyon, Horse Beach Canyon, China Canyon, Red Canyon, Knob Canyon, Canchalagua Canyon, and Pyramid Head) are partially or wholly within the boundaries of a training area (IOA, TAR, AVMA, SWAT, or Impact Area), and may be impacted by trampling. Recent documentation of *C. grisea* within these training areas suggests that, while the individual plants have the potential to be impacted by the activities described above, they are able to sustain themselves under the recent levels of traffic from vehicles and troops associated with training activities (SERG 2009–2011, GIS data). Steep slopes along the eastern escarpment may also afford the eight *C. grisea* occurrences there some topographic protection from vehicle and troop movements. The anticipated loss of individual plants from proposed increases in troop and vehicle movement is likely to increase, though this will likely be a low-level impact to the survival and recovery of *C. grisea* because it is diffuse and managed by the Navy (USFWS 2008, pp. 91–102).

Fire

Although not specifically mentioned in the listing rule, intense or frequent fires could threaten *Castilleja grisea.* In the *Factor A* discussion above, we addressed impacts of fire on the habitat; this section covers the discrete threats to individuals of *C. grisea.* As discussed in the Background section, it is unknown if *C. grisea* is adapted to periodic fires, though it is likely that this taxon is resilient to occasional fires (Navy 2002, p. D–10; Tierra Data Inc. 2005, p. 80). *Castilleja grisea* has recently been documented in portions of Horse Beach Canyon that burned up to three times since 1979, and a large occurrence was discovered in Pyramid Cove the year following a fire (Navy 1996, p. 5–2). The mechanisms and conditions under which *C. grisea* can tolerate fire, and at what frequency, are unknown. At higher than natural fire frequencies, fire has the potential to exceed a plant's capacity to persist by depleting seed banks and reducing reproductive output (Zedler *et al.* 1983, pp. 811–815). The response of *C. grisea* to fire may also be governed by the response of its host species to fire.

Castilleja grisea occurs in some areas of the island that may experience elevated fire frequency, such as SHOBA and especially the Impact Areas (Red Canyon, China Canyon, Horse Beach Canyon, Upper Chenetti Canyon) (discussed in *Factor A* above). The potential for frequent fire at many of the occurrences within SHOBA is reduced by their location on the eastern side of the island, away from Impact Areas I and II. In conjunction with its expansion of training activities, the Navy implemented a fire management plan within the MOFMP that is focused on fire prevention, fuels management, and fire suppression. These measures should minimize the frequency and spread of fires that could result in loss of *C. grisea* individuals.

Cu astilleja grisea is likely to withstand occasional fires, as demonstrated through its stability on the island since listing. Although fire ignition points are concentrated in the military training areas, fires that escape these areas can spread to most other areas of the island. However, fires that escape from training areas are not likely to disturb the entire distribution of *C. grisea* at one time because this taxon is widely distributed across San Clemente Island, and associated with steep canyon areas where fires are less likely to impact the plant. Nine of 29 *C. grisea* occurrences (31 percent; Eel Cove Canyon, Seal Cove Terraces, Red Canyon, China Canyon, Horse Beach Canyon, Upper Chenetti Canyon, Larkspur Canyon, Lemon Tank Canyon, and Snake Canyon) are more vulnerable to the spread of fire associated with military training. These occurrences include locations that fall within 0.5 mi (805 m) of TAR, or within Impact Areas where live fire and demolition training will be performed.

The Navy's fire management practices minimize ignitions as well as the spread of fires (as described above in Factor A). The Navy is conducting annual reviews of fire management and fire occurrences that will allow for adaptive management. These measures should minimize the frequency and spread of fires that could result in loss of individuals of *C. grisea.* Although, in areas operationally closed to natural resource managers, conservation actions may not be implemented, and the plant's status remains unknown. We anticipate that the Navy's implementation of the MOFMP will limit the frequency with which fires escape Impact Areas and TAR and that, through the annual review process, the Navy will identify mechanisms to reduce fire return intervals in areas not designated for incendiary use (USFWS 2008, pp. 91–122). Therefore, the impact of fire on individual *C. grisea* plants is likely a low-level threat to long-term persistence of this taxon.

Climate Change

For general information regarding climate change impacts, see above discussion on climate change under *Malacothamnus clementinus—Factor E.* Since listing of *Castilleja grisea* (USFWS 1977, p. 40684), the potential impacts of ongoing, accelerated climate change have become a recognized threat to the flora and fauna of the United States (IPCC 2007a, pp. 1–52; PRBO 2011, pp. 1–68) (for discussion of climate change scenarios in California, see *Malacothamnus clementinus—Factor E* above). San Clemente is located within a Mediterranean climatic regime, but with a significant maritime influence. Climate change models predict an increase in average temperature for southern California. There is substantial uncertainty in precipitation projections, and relatively little consensus concerning precipitation patterns and projections for southwestern California (PRBO 2011, p. 40). Less rainfall and warmer air temperatures could limit the range of *C. grisea,* although there is no direct research on the effects of climate change on the species. *Castilleja grisea* occurs in great numbers on the eastern side of the island, where fog contributes to a wetter climate. This area could become drier if fog is less frequent, possibly affecting moisture availability for *C. grisea.* The impacts of predicted future climate change to *C. grisea* remain unclear. While we recognize that climate change is an important issue with potential effects to listed species and their habitats, information is not available to make accurate predictions regarding its effects to *C. grisea* at this time.

Summary of Factor E

Castilleja grisea continues to be impacted by military activities and fire at 17 of the 29 (59 percent) occurrences on San Clemente Island. Military training activities have the potential to ignite fires within *C. grisea* habitat, though the majority of occurrences are outside of the Impact Areas and TAR where the highest impacts are recognized. The threat from fire is reduced by implementation of the Navy's MOFMP, which should limit the frequency of fires escaping from the Impact Areas, although suppression will not likely occur within the boundaries of the Impact Areas. Threats from

trampling and crushing of individual plants are likely to increase due to increases in training on the island. However, *C. grisea* has expanded its distribution on the island, and the Navy is implementing conservation measures that will continue to improve conditions for this taxon. Finally, climate change may likely influence this taxon, though the magnitude of this rangewide threat or how it may affect this taxon is unknown at this time. Given the distribution of the species and the conservation measures that will be implemented by the Navy, the threats described here currently and in the future are either of limited extent or adequately managed to reduce and minimize impacts to the species, while the potential overall threat of climate change remains unknown across this taxon's range.

Combination of Factors—Castilleja grisea

A species may be affected by more than one threat in combination. Within the preceding review of the five listing factors, we have identified multiple threats that may have interrelated impacts on the species (see above discussion on Combination of Factors under *Malacothamnus clementinus—Factor E*). The species' productivity may be reduced because of these threats, either singularly or in combination. However, it is not necessarily easy to determine (nor is it necessarily determinable) whether a particular threat is the primary threat having the greatest effect on the viability of the species, or whether it is exacerbated by or working in combination with other potential threats to have cumulative or synergistic effects on the species. While the combination of factors is a threat to the existence of *Castilleja grisea,* we are unable to determine the magnitude or extent of cumulative or synergistic effects of the combination of factors on the viability of the species at this time.

Finding

An assessment of the need for a species' protection under the Act is based on threats to that species and the regulatory mechanisms in place to ameliorate impacts from these threats. As required by section 4(a)(1) of the Act, we conducted a review of the status of these taxa and assessed the five factors in consideration of whether *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* are threatened or endangered throughout all of their range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the species. We reviewed information presented in the May 18, 2010, petition, information available in our files, and through our 90-day finding in response to this petition, and other available published and unpublished information. We also consulted with species experts and Navy staff, who are actively managing for the conservation of *M. clementinus, A. d.* var. *traskiae,* and *C. grisea* on San Clemente Island.

In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the threat is. If the threat is significant, it may drive, or contribute to, the risk of extinction of the species such that the species warrants listing as threatened or endangered as those terms are defined by the Act. This does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of threatened or endangered under the Act.

A direct threat identified in the listing rule (42 FR 40682), grazing from feral herbivores, was eliminated by 1992 through the complete removal of goats and pigs from the island (Factors A and C). This action also fulfilled one of the primary goals of the Recovery Plan under Objective 2 (USFWS 1984, p. 107). However, as a result of years of grazing, impacts from nonnative plants and erosion have continued to increase on the island. Our review of the status of *Malacothamnus clementinus, Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea* determined that threats to these species under Factors A, D, and E are present. The Navy's natural resource management and INRMP for the island have helped to ameliorate many of the threats to these species. The Navy implements natural resource management through the control of nonnative species, execution of the fire management plan, and avoidance of federally listed species. Despite current impacts from these threats to the habitat and individuals of these taxa, surveys indicate that the range of each taxon has increased since the time of listing. Increased survey efforts and survey accuracy have also shown that these taxa occupy significantly more sites than were known at listing. The extent to which this represents the detection of previously unknown occurrences, recruitment from the existing seed bank, or recolonization associated with dispersal events, or positive response to management and conservation efforts is not known. Regardless, the increase of both the range and number of occurrences for all species indicates an overall improved status for these species since listing.

The surveys and discoveries of new occurrences also contribute to the achievement of objectives in the Recovery Plan (Objective 6; USFWS 1984, p. 107). The Navy has taken measures to locate the heaviest impacts of military operations away from the species to the extent feasible while meeting operational needs, which will minimize, but not fully eliminate, the damage or destruction of individuals or occurrences of *M. clementinus, A. d.* var. *traskiae,* and *C. grisea,* partially fulfilling Objective 1 of the Recovery Plan (USFWS 1984, p. 107; USFWS 2008, pp. 90, 101, 121). However, the largest and most diverse occurrences of *Malacothamnus clementinus* are closed to natural resource monitoring and management, and their status remains unknown.

Malacothamnus clementinus

Since the removal of feral goats and pigs, the distribution of *Malacothamnus clementinus* has expanded from 3 to 11 occurrences on San Clemente Island. However, there are still significant threats to the species, including threats to habitat from military training activities directly related to land use, erosion, nonnative plants, fire, and fire management (see *Malacothamnus clementinus*—Factor A). Habitat impacts are caused by the movement of troops and vehicles over the landscape, as well as by the use of live fire, demolitions, and bombardments. Six of the 11 known occurrences of *M. clementinus* are within SHOBA, much of which serves as a buffer from military training impacts for the rest of the island. Three *M. clementinus* occurrences are directly within the Impact Areas, where frequent fire, habitat disturbance (bombardment), and troop and vehicle movement occur. This includes the occurrence at Horse Beach Canyon that comprises the greatest number of point localities and one of the two occurrences with the greatest genetic variability (Helenurm

1999, p. 39). Through implementation of the INRMP, the Navy developed an MOFMP and a nonnative plant management plan to help minimize or ameliorate these threats to the species. However, the status of *M. clementinus* at Lemon Tank Canyon and the three occurrences in Impact Areas within SHOBA remains unknown at this time, because these areas are closed to natural resource personnel (USFWS 2008, p. 50).

Threats to individual *Malacothamnus clementinus* plants also affect the species and include: Movement of vehicles and troops, fire, climate change, and low genetic diversity (see *Malacothamnus clementinus*—Factor E). The steps that the Navy has taken to minimize impacts and avoid endangered species to the extent practicable have helped ameliorate the threats caused by training to the individual *M. clementinus* plants. Climate change may impact *M. clementinus,* though the effect is largely unknown. The genetic makeup of the species has been studied (fulfilling Objective 4 of the Recovery Plan), revealing that genetic variation within the species is low. Combined with a low seed production rate and vegetative reproduction, low genetic diversity puts the species at risk of low genetic fitness and extinction by stochastic events.

The Navy implemented an INRMP to coordinate the management of natural resources on the island. Providing a framework for military operations, this plan helps to ameliorate threats to the endangered species on the island, and provides for long-term conservation planning within the scope of military readiness. Provisions included in the INRMP provide some protection for *Malacothamnus clementinus* occurrences (including *Acmispon dendroideus* var. *traskiae,* and *Castilleja grisea*), and allows adaptive management of the habitat in order to help address threats from military activities and nonnative plants. Occurrences within Impact Areas or operationally closed areas may not benefit from the conservation measures associated with the MOFMP due to lack of access for natural resources personnel. Existing regulatory mechanisms, absent the protections of the Act, provide insufficient certainty that efforts needed to address long-term conservation of the species will be implemented, or that they will be effective in reducing the level of threats to *M. clementinus* throughout its range. Under the INRMP, occurrences of *M. clementinus,* including the largest and most genetically diverse occurrences, will continue to be impacted by military activities necessary for military readiness and training, and the closure of some areas creates uncertainty as to the status of the occurrences within those areas and whether those occurrences will benefit from conservation measures.

As discussed in the Factor Analysis, a species may be affected by more than one threat in combination. For example, fires (Factors A and E) may be more intense or frequent in the habitat if there are greater amounts of nonnative grasses (Factor A) present in the vegetative community. Additionally, military activities or erosion may lead to increased nonnatives in an area. Thus, the species' viability may be reduced because of synergistic effects when multiple threats are present at one time. Therefore, the combination of factors is a threat to the existence of *Malacothamnus clementinus,* but we are unable to determine the magnitude or extent of any synergistic effects of the various factors and their impact at this time.

In conclusion, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. Our review of the information pertaining to the five threat factors does not support a conclusion that the threats have been sufficiently removed, or that their imminence, intensity, or magnitude have been reduced to the extent that the species no longer requires the protections of the Act. Four of the 11 known occurrences of the species have been closed to nonmilitary personnel, such that we are unable to assess the impacts of the threats described under the five listing factors above, nor are we able to document the status of a substantial portion of the occurrences of *Malacothamnus clementinus.* This includes one occurrence with the highest number of point localities and the greatest genetic variability. Under provision of section 4(a)(1) of the Act, we must assess the status in order to list or change the status of a species from endangered to threatened.

The 2007 status review listed land use, fire, nonnative species, erosion, natural factors, fire management, and access to SHOBA as threats to the species (USFWS 2007, p. 1–23). Although we recommended downlisting in our 2007 status review, at this time we conclude that *Malacothamnus clementinus* continues to be in danger of extinction throughout its range because of the change in intensity of training and associated impacts enacted in the 2008 MOFMP. These changes include the escalation in frequency and intensity of bombardments in Impact Areas I and II and the movement of large groups of troops and vehicles through *M. clementinus* habitat. The threats to *M. clementinus,* coupled with low genetic fitness, place this taxon at risk of extinction throughout all of its range, and reclassification from endangered to threatened is not warranted at this time.

Acmispon dendroideus var. traskiae

Since listing and the removal of feral goats and pigs on San Clemente Island, the distribution of *Acmispon dendroideus* var. *traskiae* has expanded from 6 to 29 occurrences, mainly along the western terraces and eastern escarpment. These significant gains demonstrate alleviation of threats from feral ungulates and that the species is persisting despite existing and remaining threats across the landscape. The taxon faces impacts from military training activities and land use, erosion, nonnative plants, and fire (see *Acmispon dendroideus* var. *traskiae*—*Factor A*). Impacts from land use include movement of troops and vehicles over the landscape, as well as the use of live fire, demolitions, and bombardments. Much of this activity is concentrated in training areas within the range of *A. d.* var. *traskiae.* However, many of these occurrences are along the eastern escarpment that is more protected from fire and military activity. Additionally, the majority of locations occupied by *A. d.* var. *traskiae* (24 of 29 occurrences, or 83 percent) fall outside of training areas, and thus do not receive intensive habitat disturbance. Access to the eastern escarpment, within SHOBA and east of Ridge Road, was recently closed for safety concerns. As a result, the status of 4 of 29 occurrences (14 percent) could be difficult to monitor in the future.

The Navy implemented a nonnative plant management plan and an MOFMP to ameliorate habitat threats to the species. Erosion control measures are incorporated into all project designs to minimize the potential to exacerbate existing erosion and avoid impacts to listed species (Munson 2011a, pers. comm.). Additionally, large-scale island-wide maneuvers with assault vehicles have been postponed until an erosion control plan is drafted and implemented. While it is anticipated that military training activities, erosion, nonnatives, and fire will have ongoing impacts to the taxon's habitat, based on the current distribution of this taxon and existing conservation efforts, impacts from these threats are reduced and minimized for *Acmispon dendroideus* var. *traskiae.*

Under the Sikes Act, the Navy has implemented an INRMP to organize the management of natural resources on the island (also see above discussion in the Finding section for *Malacothamnus clementinus*). Existing regulatory mechanisms, absent the protections of the Act, provide insufficient certainty that efforts needed to address long-term conservation of the species will be implemented, or that they will be effective in reducing the level of threats to *Acmispon dendroideus* var. *traskiae* throughout its range. Under the INRMP, occurrences of *A. d.* var. *traskiae* will continue to be impacted by military activities necessary for military readiness and training.

Individual *Acmispon dendroideus* var. *traskiae* plants also face threats on the island. Movement of vehicles and troops, fire, climate change, and hybridization with related species all impact the status of the species (see *Acmispon dendroideus* var. *traskiae—Factor E*). The steps that the Navy has taken to minimize impacts and avoid endangered species to the extent practicable are ameliorating the threat of trampling individual *A. d.* var. *traskiae* plants caused by training. Hybridization has also been studied (fulfilling Objective 4 of the Recovery Plan), with confirmed hybrids occurring in Wilson Cove (Wilson Cove). The genetic integrity of *A. d.* var. *traskiae* may be threatened by hybridization with *A. argophyllus* var. *argenteus* at one of the largest occurrences, and requires further investigation. The threats described here (*Factor E*) are either of limited or undetermined magnitude, or reduced to the extent that we anticipate they will not impede the recovery of *A. d.* var. *traskiae.*

As discussed above in the Factor Analysis, a species may be affected by more than one threat in combination. For example, fires (Factors A and E) may be more intense or frequent in the habitat if there are greater amounts of nonnative grasses (Factor A) present in the vegetative community. Thus, the species' viability may be reduced because of threats in combination. Therefore, the combination of factors is a threat to the existence of *Acmispon dendroideus* var. *traskiae,* but we are unable to determine the magnitude or extent of any synergistic effects of the various factors and their impact at this time.

In conclusion, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. After review of the information pertaining to the five threat factors, we find that the ongoing threats are not of sufficient imminence, intensity, or magnitude to indicate that *Acmispon dendroideus* var. *traskiae* is presently in danger of extinction throughout its range and does not, therefore, meet the definition of an endangered species. While *A. d.* var. *traskiae* will continue to be impacted by military training activities and land use, erosion, nonnative plants, and fire, the expanded number of occurrences reduces the severity and magnitude of threats and the likelihood that any one event would affect all occurrences of the species. The extent of hybridization within the species is also not known and could affect the genetic integrity of the plant. Additionally, the plant occurs in recently closed areas, and these occurrences will not be able to be accessed or managed in the future with these closures.

Though these threats to *Acmispon dendroideus* var. *traskiae* still exist and will continue into the foreseeable future, the range of this taxon has substantially increased since listing, and the Navy is implementing conservation actions through their INRMP to reduce threats impacting *A. d.* var. *traskiae.* Therefore, we find that the petitioned action to downlist *A. d.* var. *traskiae* to threatened is warranted. Please see the Significant Portion of the Range Analysis section below for our evaluation as to whether this species may or may not be in danger of extinction in a significant portion of its range.

Castilleja grisea

The known distribution of *Castilleja grisea* has expanded from 19 to 29 known occurrences since listing, likely due to the removal of feral goats and pigs from the island in 1992. These significant gains demonstrate some alleviation of threats from feral ungulates and that the species is persisting despite existing and remaining threats across the landscape. *Castilleja grisea* faces impacts from military training activities and land use, erosion, nonnative plants, fire, and fire management (see *Castilleja grisea—Factor A*). The movement of troops and vehicles over the landscape, as well as use of live fire, demolitions, and bombardments, results in destruction and degradation of habitat occupied by *C. grisea.* Much of this activity is concentrated in SHOBA within training areas and Impact Areas. Four occurrences are within the Impact Areas, where frequent fire, habitat disturbance (bombardment), and troop and vehicle movement take place in the heavily used ranges. Access to parts of SHOBA, including the eastern escarpment and east of Ridge Road, was recently closed for safety concerns. The status of the four occurrences may be difficult to assess in the future, although these areas may be more protected from fire and military activity and are likely less impacted by habitat threats. A large proportion of *C. grisea* occurrences fall outside Impact Areas, TAR, and fuelbreaks, where the most intensive habitat disturbances are likely to take place.

Threats impacting individual plants of *Castilleja grisea* on the island include: movement of vehicles and troops, fire, and potentially climate change (see *Castilleja grisea—Factor E*). The Navy has ameliorated the threats to individual plants by taking steps to minimize training impacts and measures to avoid endangered species to the extent practicable. The threats described under Factor E are either of limited extent or adequately managed and are not likely to impede the recovery of *C. grisea.*

Under the Sikes Act, the Navy has implemented an INRMP to organize the management of natural resources on the island (also see above discussion in the Finding section for *Malacothamnus clementinus*). Existing regulatory mechanisms, absent the protections of the Act, provide insufficient certainty that efforts needed to address long-term conservation of the species will be implemented, or that they will be effective in reducing the level of threats to *Castilleja grisea* throughout its range. Under the INRMP, occurrences of *C. grisea* will continue to be impacted by military activities necessary for military readiness and training.

As discussed above in the Factor Analysis, a species may be affected by more than one threat in combination. For example, fires (Factors A and E) may be more intense or frequent in the habitat if there are greater amounts of nonnative grasses (Factor A) present in the vegetative community. Thus, the species' viability may be reduced because of threats in combination. Therefore, the combination of factors is a threat to the existence of *Castilleja grisea,* but we are unable to determine the magnitude or extent of any synergistic effects of the various factors and their impact at this time.

In conclusion, we have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. After review of the information pertaining to the five threat factors, we find the ongoing threats are not of sufficient imminence, intensity, or magnitude to indicate that *Castilleja grisea* is

presently in danger of extinction across its range. While *C. grisea* will continue to be impacted by military training activities and land use, erosion, nonnative plants, and fire, the expanded number of occurrences reduces the severity and magnitude of threats and the likelihood that any one event would affect all occurrences of the species. Additionally, the plant occurs in operationally closed areas, such as the Impact Areas, where threats are concentrated and occurrences cannot be accessed or managed with these closures.

Though threats to *Castilleja grisea* still exist and will continue into the foreseeable future, the range of this taxon has substantially increased since listing, and the Navy is implementing conservation actions through their INRMP to reduce threats impacting *C. grisea.* Therefore, we find that the petitioned action to downlist *C. grisea* to threatened is warranted at this time. Please see the Significant Portion of the Range Analysis section below for our evaluation as to whether this species may or may not be in danger of extinction in a significant portion of its range.

Significant Portion of the Range Analysis

The Act defines ''endangered species'' as any species which is ''in danger of extinction throughout all or a significant portion of its range,'' and ''threatened species'' as any species which is ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The definition of ''species'' is also relevant to this discussion. The Act defines the term ''species'' as follows: ''The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature.'' The phrase ''significant portion of its range'' (SPR) is not defined by the statute, and we have never addressed in our regulations: (1) The consequences of a determination that a species is either endangered or likely to become so throughout a significant portion of its range, but not throughout all of its range; or (2) what qualifies a portion of a range as ''significant.''

Two recent district court decisions have addressed whether the SPR language allows the Service to list or protect less than all members of a defined ''species'': *Defenders of Wildlife* v. *Salazar,* 729 F. Supp. 2d 1207 (D. Mont. 2010), concerning the Service's delisting of the Northern Rocky Mountain gray wolf (74 FR 15123, Apr. 12, 2009); and *WildEarth Guardians* v. *Salazar,* 2010 U.S. Dist. LEXIS 105253 (D. Ariz. Sept. 30, 2010), concerning the Service's 2008 finding on a petition to list the Gunnison's prairie dog (73 FR 6660, Feb. 5, 2008). The Service had asserted in both of these determinations that it had authority, in effect, to protect only some members of a ''species,'' as defined by the Act (i.e., species, subspecies, or DPS), under the Act. Both courts ruled that the determinations were arbitrary and capricious on the grounds that this approach violated the plain and unambiguous language of the Act. The courts concluded that reading the SPR language to allow protecting only a portion of a species' range is inconsistent with the Act's definition of ''species.'' The courts concluded that once a determination is made that a species (i.e., species, subspecies, or DPS) meets the definition of ''endangered species'' or ''threatened species,'' it must be placed on the list in its entirety and the Act's protections applied consistently to all members of that species (subject to modification of protections through special rules under sections 4(d) and 10(j) of the Act).

Consistent with that interpretation, and for the purposes of this finding, we interpret the phrase ''significant portion of its range'' in the Act's definitions of ''endangered species'' and ''threatened species'' to provide an independent basis for listing; thus there are two situations (or factual bases) under which a species would qualify for listing: A species may be endangered or threatened throughout all of its range; or a species may be endangered or threatened in only a significant portion of its range. If a species is in danger of extinction throughout an SPR, it, the species, is an ''endangered species.'' The same analysis applies to ''threatened species.'' Therefore, the consequence of finding that a species is endangered or threatened in only a significant portion of its range is that the entire species shall be listed as endangered or threatened, respectively, and the Act's protections shall be applied across the species' entire range.

We conclude, for the purposes of this finding, that interpreting the SPR phrase as providing an independent basis for listing is the best interpretation of the Act because it is consistent with the purposes and the plain meaning of the key definitions of the Act; it does not conflict with established past agency practice (i.e., prior to the 2007 Solicitor's Opinion), as no consistent, long-term agency practice has been established; and it is consistent with the judicial opinions that have most closely examined this issue. Having concluded that the phrase ''significant portion of its range'' provides an independent basis for listing and protecting the entire species, we next turn to the meaning of ''significant'' to determine the threshold for when such an independent basis for listing exists.

Although there are potentially many ways to determine whether a portion of a species' range is ''significant,'' we conclude, for the purposes of this finding, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for ''significant'' in terms of an increase in the risk of extinction for the species. We conclude that a biologically based definition of ''significant'' best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species' conservation. Thus, for the purposes of this finding, a portion of the range of a species is ''significant'' if its contribution to the viability of the species is so important that, without that portion, the species would be in danger of extinction.

We evaluate biological significance based on the principles of conservation biology using the concepts of redundancy, resiliency, and representation. *Resiliency* describes the characteristics of a species that allow it to recover from periodic disturbance. *Redundancy* (having multiple populations distributed across the landscape) may be needed to provide a margin of safety for the species to withstand catastrophic events. *Representation* (the range of variation found in a species) ensures that the species' adaptive capabilities are conserved. Redundancy, resiliency, and representation are not independent of each other, and some characteristic of a species or area may contribute to all three. For example, distribution across a wide variety of habitats is an indicator of representation, but it may also indicate a broad geographic distribution contributing to redundancy (decreasing the chance that any one event affects the entire species), and the likelihood that some habitat types are less susceptible to certain threats, contributing to resiliency (the ability of the species to recover from disturbance). None of these concepts is intended to be mutually exclusive, and a portion of a species' range may be determined to be ''significant'' due to its contributions under any one of these concepts.

For the purposes of this finding, we determine if a portion's biological contribution is so important that the portion qualifies as ''significant'' by

asking whether, without that portion, the representation, redundancy, or resiliency of the species would be so impaired that the species would have an increased vulnerability to threats to the point that the overall species would be in danger of extinction (i.e., would be ''endangered''). Conversely, we would not consider the portion of the range at issue to be ''significant'' if there is sufficient resiliency, redundancy, and representation elsewhere in the species' range that the species would not be in danger of extinction throughout its range if the population in that portion of the range in question became extirpated (extinct locally).

We recognize that this definition of ''significant'' establishes a threshold that is relatively high. On the one hand, given that the consequences of finding a species to be endangered or threatened in an SPR would be listing the species throughout its entire range, it is important to use a threshold for ''significant'' that is robust. It would not be meaningful or appropriate to establish a very low threshold whereby a portion of the range can be considered ''significant'' even if only a negligible increase in extinction risk would result from its loss. Because nearly any portion of a species' range can be said to contribute some increment to a species' viability, use of such a low threshold would require us to impose restrictions and expend conservation resources disproportionately to conservation benefit: listing would be rangewide, even if only a portion of the range of minor conservation importance to the species is imperiled. On the other hand, it would be inappropriate to establish a threshold for ''significant'' that is too high. This would be the case if the standard were, for example, that a portion of the range can be considered ''significant'' only if threats in that portion result in the entire species' being currently endangered or threatened. Such a high bar would not give the SPR phrase independent meaning, as the Ninth Circuit held in *Defenders of Wildlife* v. *Norton,* 258 F.3d 1136 (9th Cir. 2001).

The definition of ''significant'' used in this finding carefully balances these concerns. By setting a relatively high threshold, we minimize the degree to which restrictions will be imposed or resources expended that do not contribute substantially to species conservation. But we have not set the threshold so high that the phrase ''in a significant portion of its range'' loses independent meaning. Specifically, we have not set the threshold as high as it was under the interpretation presented by the Service in the *Defenders* litigation. Under that interpretation, the portion of the range would have to be so important that current imperilment there would mean that the species would be *currently* imperiled everywhere. Under the definition of ''significant'' used in this finding, the portion of the range need not rise to such an exceptionally high level of biological significance. (We recognize that if the species is imperiled in a portion that rises to that level of biological significance, then we should conclude that the species is in fact imperiled throughout all of its range, and that we would not need to rely on the SPR language for such a listing.) Rather, under this interpretation we ask whether the species would be endangered everywhere without that portion, *i.e.,* if that portion were completely extirpated. In other words, the portion of the range need not be so important that even being in danger of extinction in that portion would be sufficient to cause the remainder of the range to be endangered; rather, the complete extirpation (in a hypothetical future) of the species in that portion would be required to cause the remainder of the range to be endangered.

The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that have no reasonable potential to be significant and threatened or endangered. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be ''significant,'' and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not ''significant,'' we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is ''significant.'' In practice, a key part of the portion status 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 species' range that clearly would not meet the biologically based definition of ''significant,'' such portions will not warrant further consideration.

Having determined that *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* are no longer endangered throughout their ranges as a consequence of the threats evaluated under the five factors in the Act, we must next consider whether there are any significant portions of these two species' ranges where they are currently endangered. 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 as evaluated based upon its representation, resiliency, or redundancy.

Acmispon dendroideus var. *traskiae*

Applying the process described above, we evaluated the range of *Acmispon dendroideus* var. *traskiae* to determine if any units could be considered a significant portion of its range. This taxon is an island endemic restricted to a single, small island, with no natural division in its range. Because of its limited range and number of occurrences in close proximity to one another, no portion is likely to have a greater contribution to representation, resiliency, or redundancy than other portions. Furthermore, the existing and potential primary direct and indirect threats from military training activities, nonnative plant species, fire, and erosion are relatively uniform across San Clemente Island, indicating that no portions of its range are experiencing a greater severity or magnitude of threats. We conclude that there are no portions that warrant further consideration under this analysis.

In summary, the primary threats to *Acmispon dendroideus* var. *traskiae* are relatively uniform throughout its range. We determined that none of the existing or potential threats, either alone or in combination with others, currently place *A. d.* var. *traskiae* in danger of extinction throughout all or a significant portion of its range. However, without the continued protections of the Act, this taxon is likely to become endangered throughout its range in the foreseeable future. Threatened status is therefore appropriate for *A. d.* var. *traskiae* throughout its entire range.

Castilleja grisea

Applying the process described above, we evaluated the range of *Castilleja grisea* to determine if any units could be considered a significant portion of its range (also see the Significant Portion of the Range

Analysis section above for *Acmispon dendroideus* var. *traskiae*). This island endemic is restricted to a single, small island with no natural division in its range. Because of its limited range and number of occurrences in close proximity to one another, no portion is likely to have a greater contribution to its representation, resiliency, or redundancy than other portions. The primary threats to *C. grisea,* military training activities, nonnative plant species, fire, and erosion, are relatively uniform throughout its range (San Clemente Island), indicating that no portion is experiencing a greater severity or magnitude of threats. We conclude that there are no portions that warrant further consideration under this analysis. We determined that none of the existing or potential threats, either alone or in combination with others, currently place *C. grisea* in danger of extinction throughout all of its range. However, without the continued protections of the Act, this taxon is likely to become endangered throughout its range in the foreseeable future. Threatened status is therefore appropriate for *C. grisea* throughout its entire range.

Effects of This Rule

If this proposed rule is made final, it would revise 50 CFR 17.12(h) to reclassify *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* from endangered to threatened on the List of Endangered and Threatened Plants and to correct the scientific and common names for *Acmispon dendroideus* var. *traskiae.* However, this reclassification does not significantly change the protections afforded these species under the Act. The regulatory protections of section 9 and section 7 of the Act (see *Factor D,* above) would remain in place. Pursuant to section 7 of the Act, all Federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of *A. d.* var. *traskiae* and *C. grisea.* Whenever a species is listed as threatened, the Act allows promulgation of special rules under section 4(d) that modify the standard protections for threatened species found under section 9 of the Act and Service regulations at 50 CFR 17.31 and 17.71, when it is deemed necessary and advisable to provide for the conservation of the species. There are no 4(d) rules in place or proposed for *A. d.* var. *traskiae* and *C. grisea,* because there is currently no conservation need to do so for these species.

Recovery actions directed at *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* will continue to be implemented as outlined in the Recovery Plan for the Endangered and Threatened Species of the California Channel Islands (USFWS 1984). This recovery plan addresses 10 plants (including *Malacothamnus clementinus, A. d.* var. *traskiae,* and *C. grisea*) and animals distributed among three of the Channel Islands (USFWS 1984).

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule to reclassify *Acmispon dendroideus* var. *traskiae* and *Castilleja grisea* from endangered to threatened. The purpose of peer review is to ensure that our proposed rule is based on scientifically sound data, assumptions, and analyses. We have invited these peer reviewers to comment during this public comment period on our proposed downlisting.

We will consider all comments and information we receive during this comment period on this proposed rule during our preparation of the final determination. Accordingly, the final decision may differ from this proposal.

Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. We must receive your request within 45 days after the date of this **Federal Register** publication. Send your request to the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the names of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Executive Order 13211

Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. This rule is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action and no Statement of Energy Effects is required.

Paperwork Reduction Act of 1995

Office of Management and Budget (OMB) regulations at 5 CFR part 1320, which implement provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), require that Federal agencies obtain approval from OMB before collecting information from the public. This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

We determined we do not need to prepare an Environmental Assessment or an Environmental Impact Statement, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* and upon request from the Carlsbad Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Author(s)

The primary authors of this package are the staff members of the Carlsbad Fish and Wildlife Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.12(h) under ''Flowering Plants'' by removing the entry for *''Lotus dendroideus* var. *traskiae''* and adding an entry for *''Acmispon dendroideus* var. *traskiae''* and revising the entry for ''*Castilleja grisea''* to read as follows:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*	*	
Acmispon dendroideus var. *traskiae*.	San Clemente Island lotus.	U.S.A. (CA)	Fabaceae	T	26	NA	NA
*	*	*	*	*	*	*	
Castilleja grisea	San Clemente Island Paintbrush.	U.S.A. (CA)	Orobanchaceae	T	26	NA	NA
*	*	*	*	*	*	*	

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: May 1, 2012.

David L. Cottingham,

Acting Director, Fish and Wildlife Service.

[FR Doc. 2012–11339 Filed 5–15–12; 8:45 am]

BILLING CODE 4310–55–P