Billing Code 4310–55–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2011–0041]

[4500030113]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List Six Sand Dune Beetles as Endangered or Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list six Nevada sand dune beetle species as endangered or threatened and to designate critical habitat under the Endangered Species Act of 1973, as amended (Act). In our 90-day finding on this petition (76 FR 47123, August 4, 2011), we determined that the petition presented substantial information indicating that listing may be warranted for four of the six species: Crescent Dunes aegialian scarab (*Aegialia crescenta*), Crescent Dunes serican scarab (*Serica ammomenisco*), large aegialian scarab (*Aegialia magnifica*), and Giuliani's dune scarab (*Pseudocotalpa giulianii*). We also determined that the petition did not present substantial information indicating that listing the other two species, Hardy's aegialian scarab (*Aegialia hardyi*) and Sand Mountain serican scarab (*Serica psammobunus*), may be warranted. We therefore initiated status reviews on only the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab. After review of the best available scientific and commercial information, we find that listing these four beetle species is not warranted at this time. However, we ask the public to submit to us any new information that becomes available concerning the threats to these four beetle species or their habitat at any time.

DATES: The finding announced in this document was made on [INSERT DATE OF FEDERAL REGISTER PUBLICATION].

ADDRESSES: This finding is available on the internet at *http://www.regulations.gov* at Docket Number FWS–R8–ES–2011–0041. The supporting documentation used in preparing this finding is available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Nevada Fish and Wildlife Office, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130. Please submit any new information, materials, comments, or questions concerning this finding to the above street address.

FOR FURTHER INFORMATION CONTACT: Edward D. Koch, State Supervisor, Nevada Fish and Wildlife Office (see **ADDRESSES**); by telephone at 775–861–6300; or by facsimile at 775–861–6301. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq*.) requires that, for any petition to revise the Federal Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific or commercial information indicating that listing a 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 that the petitioned action is: (1) Not warranted, (2) warranted, or (3) 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. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring a subsequent finding to be made within 12 months. We must publish these 12-month findings in the **Federal Register**.

Petition History

On February 2, 2010, we received a petition dated January 29, 2010, from WildEarth Guardians (referred to below as the petitioner). The petitioner requested that the Service list six species of sand dune beetles in Nevada as endangered or threatened, and designate critical habitat, under the Act. The six beetle species are Hardy's aegialian scarab (*Aegialia hardyi*), Sand Mountain serican scarab (*Serica psammobunus*), Crescent Dunes aegialian scarab (*A. crescenta*), Crescent Dunes serican scarab (*S. ammomenisco*), large aegialian scarab (*A. magnifica*), and Giuliani's dune scarab (*Pseudocotalpa giulianii*). Included in the petition was supporting information regarding the species' taxonomy and ecology, historical and current distribution, current status, and actual and potential causes of decline.

On March 12, 2010, we acknowledged receipt of the petition in a letter to the petitioner. We informed the petitioner that we reviewed the information presented in the petition and determined that issuing an emergency regulation temporarily listing the species under section 4(b)(7) of the Act was not necessary. We also stated that we anticipated making an initial finding in fiscal year 2010.

On August 4, 2011, we made our 90-day finding that the petition did not present substantial scientific or commercial information indicating that listing two of the six beetle species, the Hardy's aegialian scarab and Sand Mountain serican scarab, may be

warranted (76 FR 47123, August 4, 2011). Therefore, no further action is required on the petition as it relates to these two species. However, we determined that the petition presented substantial scientific or commercial information indicating that listing of the other four beetle species, the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab, may be warranted. At that time, we initiated a review of the status of these species to determine if listing these four beetle species is warranted.

This notice constitutes the status review on the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab and the 12-month finding on the February 2, 2010, petition to list these species as endangered or threatened and to designate critical habitat under the Act.

Previous Federal Actions

On August 10, 1978, the Service proposed to list Giuliani's dune scarab as threatened, citing the effects of off-road vehicle (ORV) use (43 FR 35636). The Service stated that ORV activity compacts dead organic matter accumulated on dune slopes and prevents its buildup, thereby destroying the larval habitat of the beetle. The proposed rule also determined that there were no State and Federal laws protecting the species and its habitat. Included in the proposed rule was a proposal to designate critical habitat at Big Dune, Nye County, Nevada.

On October 1, 1980, the Service withdrew the proposal to list Giuliani's dune scarab (45 FR 65137). We took this action because, at that time, amendments to the Act mandated that we withdraw any proposed rules to list species that we had not finalized within 2 years of the proposal.

In 1984, 1989, and 1991, we published notices of review that identified Crescent Dunes aegialian scarab, large aegialian scarab, and Giuliani's dune scarab as candidates under consideration for addition to the List of Endangered and Threatened Wildlife (49 FR 21664, May 22, 1984; 54 FR 554, January 6, 1989; 56 FR 58804, November 21, 1991). In each notice of review, each beetle was identified as a category 2 candidate. Category 2 candidates were those for which the Service possessed information indicating that listing as endangered or threatened was possibly appropriate but for which conclusive data on biological vulnerability and threats were not currently available to support a proposed rule.

On February 28, 1996, the Service adopted a single category of candidate species and no longer considered category 2 species as candidates (61 FR 7595), thus removing the beetles from consideration. The decision to stop considering category 2 species as candidates was designed to reduce confusion about the status of these species and to clarify that we no longer regarded these species as candidates for listing.

Species Information

Taxonomy and Species Description

As a whole, the invertebrates of Nevada are poorly studied, and there is limited life-history information for these sand dune beetle species (NDOW 2006, p. 12). However, the taxonomic information is available and was reviewed to reach the conclusion that each of these species is a valid taxon. All four of the beetle species are taxonomically categorized as follows: Kingdom Animalia, Phylum Mandibulata, Class Insecta, Order Coleoptera, Superfamily Scarabaeoidea, Family Scarabaeidae.

The Crescent Dunes aegialian scarab (Subfamily Aphodiinae, Tribe Aegialiini (Brown 1931, pp. 9, 11–12), *Aegialia crescenta*) was first described in 1977 (Gordon and Cartwright 1977, pp. 45–47) and genetically analyzed in 1997 (Porter and Rust 1997, pp. 304, 306, 308). These beetles are 3.75 to 5.00 millimeters (mm) (about 0.19 inch (in)) long and 2.05 to 2.70 mm (less than 0.13 in) wide (Gordon and Cartwright 1977, p. 45). The adults are dark reddish brown with yellowish underside, legs, and mouthparts. Little is known about the larvae of the Crescent Dunes aegialian scarab.

The Crescent Dunes serican scarab (Subfamily Melolonthinae, Tribe Sericini (Hayes 1929, p. 26), *Serica ammomenisco*) (errantly spelled *ammomensico* in some texts) was first described in 1987 (Hardy and Andrews 1987, pp. 173–174). The name is derived from the Greek *ammo* (sand) and *menisco* (crescent) and refers to the only place they are known to occur, Crescent Dunes. These beetles are 6.5 to 8.2 mm (0.25 to 0.33 in) long and 3.4 mm (0.13 in) wide (Hardy and Andrews 1987, p. 173). The adults have a black head and thorax with dark brown legs; however, their color ranges from pale brown to brownish black (Hardy and Andrews 1987, p. 173). They are recognized by the band of pale hairs behind the top of the head (clypeus), their relatively light coloration, and the unique genitalia of the males (Hardy and Andrews 1987, p. 173). Little is known about larvae of the Crescent Dunes serican scarab.

The large aegialian scarab (Subfamily Aphodiinae, Tribe Aegialiini (Brown 1931, pp. 9, 11–12), *Aegialia magnifica*) also was first described by Gordon and Cartwright in 1977 (pp. 43–45) and genetically analyzed in 1995 (Porter and Rust 1996, pp. 711, 716, 718; 1997, pp. 304, 306, 308). These beetles are 4.40 to 5.90 mm (about 0.25 in) long and 2.48 to 3.25 mm (less than 0.25 in) wide (Gordon and Cartwright 1977, p. 43). The adults are pale red with yellowish-red mouthparts and underside. They have a smooth upper back and do not have wings. Little is known about the larvae of the large aegialian scarab.

The Giuliani's dune scarab (Subfamily Rutelinae, Tribe Rutelini (Hayes 1929, p. 29), *Pseudocotalpa giulianii*) was first described by Hardy in 1974 (pp. 243–247). These beetles are 17 to 25 mm (0.75 to 1 in) long and 7 to 10 mm (0.25 to 0.50 in) wide (Hardy 1974 p. 244). The adults are light tan with a more yellowish head; the legs are darker tan with reddish brown feet (tarsi) and claws. Males and females are similar in appearance, but easily distinguished by the size of the claws at the end of their rear legs; female claws are equal whereas the outer claw of the male is twice as long as the inner (Rust 1985, p. 105). Larvae average 12 mm (0.47 in) in length and resemble a white grub (Rust 1985, p.

108).

These four beetle species are not vertebrates and therefore the Service's Distinct Vertebrate Population Segment policy (61 FR 4722, February 7, 1996) does not apply.

Habitat

Many genera of Scarabaeidae in North American deserts, including these four dune beetle species, occur in vegetated, unstable, sandy areas around sand dunes. The dunes and surrounding unstable, sandy areas are created by sand that is carried by wind from dry lakebeds upwind of the dunes. These four beetle species burrow and live in loose sand, eat decomposed plant matter, and mate on live vegetation (Hardy 1971, pp. 240–241; 1976, pp. 301–302; Gordon and Cartwright 1977, p. 42; Hardy and Andrew 1987, p. 178; Rust 1982, pp. 3–4). The beetles need moist sand to protect them from temperature extremes (both hot and cold) and drying out (Porter and Rust 1996, p. 709; Service 2012a, p. 3).

Distribution

The historical range of each of these four beetle species is unknown. It is also unknown whether the range of any of the four species has changed since they were first described in the 1970s and 1980s.

Based on surveys conducted in January 2012, the current known range of the Crescent Dunes aegialian scarab is limited to 6,594 ha (16,295 ac) of BLM-administered lands at two main sand dunes—Crescent Dunes and San Antonio Dunes, within a larger dune complex in Big Smoky Valley (Nachlinger *et al*. 2001, p. A10-82; Service 2012a, pp. 1, 5). Crescent Dunes is a 402-hectare (ha) (996-acre (ac)) complex of crescent-shaped sand dunes located about 19 kilometers (km) (12 miles (mi)) northwest of Tonopah, Nye County, Nevada (NRCS 1972, pp. 23, 55, Maps 15, 18, 21; 2006a, p. 1). Crescent Dunes is created by prevailing winds from the northwest, which are primarily associated with Pacific Ocean Cell winter storms (i.e., El Niño and La Niña) (Parsons 2010, p. 15). Studies indicate that the Crescent Dunes system has moved less than 76 meters (m) (250 feet (ft)) southeast since 1954 (Parsons 2010, pp. 18–19). San Antonio Dunes is a 751-ha (1,856-ac) complex of dunes located approximately 24 km (15 mi) north of Crescent Dunes at the northern edge of the San Antonio Mountains. It is likely that San Antonio Dunes is created by the same prevailing wind that has created Crescent Dunes.

Based on surveys conducted in January 2012, the current known range of the Crescent Dunes serican scarab is restricted to 5,843 ha (14,439 ac) of BLM-administered land at Crescent Dunes (at this time it is unknown if it occurs at the nearby San Antonio Dunes) (Hardy and Andrew 1987, p. 178; Gordon and Cartwright 1977, p. 45; Hardy and Andrews 1987, p. 173; Service 2012a, p. 1). The species' range estimates are larger than the areas of the dunes (as indicated above) because the beetles occur on the dune and in sandy areas surrounding the dune.

It is unknown if the Crescent Dunes aegialian scarab and the Crescent Dunes serican scarab also occur at sand dunes on BLM-administered lands near Millers, Nevada, and about 40 km (25 mi) southwest of the Crescent Dunes. These dunes are part of the same larger dune complex as Crescent Dunes within Big Smoky Valley (BLM and DOE 2010, pp. 11.7–60; Service 2012a, p. 1). Gordon and Cartwright reported a record for the Crescent Dunes aegialian scarab at Game Range Dunes in Clark County, Nevada (1988, p. 18). However, we have no other information confirming that the Crescent Dunes aegialian scarab occurs anywhere other than at Crescent Dunes and San Antonio Dunes. Presence of the Crescent Dunes aegialian scarab at Game Range Dunes is unlikely because these dunes are located approximately 200 km (125 mi) southeast of Crescent Dunes.

The current known range of the large aegialian scarab and Giuliani's dune scarab is restricted to two sand dune complexes on BLM-administered lands—Big Dune (also called Amargosa Dunes) and Lava Dune (Hardy 1974, pp. 243–247; Gordon and Cartwright 1977, pp. 43–45; Porter and Rust 1996, p. 718; Service 2011a, pp. 1–12 ; 2011b p. 1–7; 2012b pp. 1–4). Big Dune is a 305-ha (753-ac) complex star sand dune located 16.5 km (10 mi) west of Lathrop Wells, Nye County, Nevada (NRCS 1998, pp. 35, Map 33). It is formed from prevailing winds from the northeast (PSI 2009, p. F-21); however, the wind directions at Big Dune vary seasonally and are also out of the southeast (BLM and DOE 2010, p. 11.1-209). Lava Dune is a 170-ha (420-ac) dune located 6 km (4.5 mi) east of Big Dune, which was formed from sand trapped at the base of an old volcanic cinder cone and lava flow (NRCS 2006b, p. 1).

Based on surveys conducted in February 2012, the estimated range of the large aegialian scarab is 490 ha (1,212 ac) of BLM-administered land at Big Dune and approximately 200 ha (494 ac) of BLM-administered land at Lava Dune (Service 2011a, pp. 3–4; 2012b, p. 3). The species' range estimate is larger than the areas of the dunes (as indicated above) because the beetle occurs on the dune and in sandy and vegetated areas surrounding the dune. The large aegialian scarab has a patchy distribution, but occurs underneath every species of live vegetation throughout the Big Dune area (Service 2012b p. 2).

Based on surveys conducted in April 2011, the estimated range of the Giuliani's dune scarab is 307 ha (759 ac) of BLM-administered land at Big Dune and 200 ha (494) of BLM-administered land at Lava Dune (Service 2012b, p. 3). The species' range estimate is larger than the areas of the dunes (as indicated above) because the beetle occurs on the dune and in sandy areas surrounding the dune. The Giuliani's dune scarab has a clumped distribution and uses the north face of the dune more heavily than the south and west faces (BLM 2007, p. 4; Boyd 2010, pp. 2, 6–7). Three other dune complexes located near Big Dune and Lava Dune—the Skeleton Hills, Dumont Dunes, and Ibex Dune—have been surveyed for Giuliani's dune scarab, but none were found (Hardy and Andrews 1976, pp. 1–44; Rust 1982, p. 2).

Biology and Population Abundance

Crescent Dunes Aegialian Scarab and Crescent Dunes Serican Scarab— Little is known about the population abundance or biology of the Crescent Dunes aegialian scarab and Crescent Dunes serican scarab. During a survey in January 2012, the Crescent Dunes aegialian scarab was observed beneath every species of live plant surrounding the dunes, such as *Oryzopsis hymenoides* (Indian ricegrass), *Atriplex* spp. (saltbush), and *Salsola* spp. (tumbleweed) (Service 2012a, p. 3). The sex ratio of Crescent Dunes aegialian scarab at Crescent Dunes was one male to one female (Service 2012a, p. 5). We reviewed other regional sand dune-obligate beetles as surrogates, but did not locate life-history information for the Crescent Dunes aegialian scarab and Crescent Dunes serican scarab (Gordon 1975, pp. 173–175; Gordon and Cartwright 1977, pp. 47–48; Andrews *et al*. 1979, p. 19; Rust 1986, pp. 47–51; Service 1992, pp. 1–5; Britten and Rust 1996, pp. 649–651; Van Dam and Van Dam 2006, pp. 31–35). However, it is likely the Crescent Dunes aegialian scarab has similar life history to the large aegialian scarab because they are taxonomically related and genetically similar (Porter and Rust 1997, pp. 304, 306, 308).

Large Aegialian Scarab—Both adult and larval large aegialian scarabs live beneath any species of live plant throughout the Big Dune area, such as *Larrea tridentata* (creosote bush) and *Salsola* spp. (Rust 1995, p. 7; Service 2012b, p. 2). They burrow into loose sand to access wet sand (Hardy and Andrew 1987, p. 175). The year-round wet sand is usually 0.5 to 1.0 m (1.6 to 3.3 ft) under the surface. They can be located from October to April by sifting moist sand 8 to 33 centimeters (cm) (3 to 13 in) deep beneath dune plants (Rust 1995, p. 6). Adult large aegialian scarabs are most active from mid-February to late April. Based on limited reported survey data, we were not able to estimate population abundance for this species. In the only reported survey, a combined total of 316 large aegialian scarabs were observed at Big Dune from March to April 2007 (Boyd 2010, pp. 5–6). Presence of large aegialian scarabs at Lava Dune was confirmed, but only limited sampling occurred on December 17, 2007 (Boyd 2010, pp. 9–10).

Giuliani's Dune Scarab—Adult Giuliani's dune scarabs live underneath vegetation closely surrounding the edge of the large dune, and most commonly occur under *Petalonyx thurberi* (sandpaper plant) (Rust 1995, p. 6; Boyd 2010, p. 10). They are only observed aboveground when they emerge for 3 weeks from late April to early May. They emerge for 5 to 30 minutes each evening to hover over and mate on shrub vegetation and the sand surface (Hardy 1971, pp. 240–241; 1976, pp. 301–302; Rust 1982, pp. 3, 5; Service 2011a, pp. 2–5). Aboveground mating activity is greatly reduced when it is cold and windy (Rust 1982, p. 4; 1985 p. 106; Boyd 2010, p. 4).

In trying to determine how long adult Giuliani's dune scarabs live, the Bureau of Land Management (BLM) marked approximately 160 beetles over a 3-week period in April 2011; only one adult beetle was recaptured 1 week after its original capture (Service 2011a, p. 4). The adults do not feed (Rust 1982, p. 9), and it is unknown how long they live once they change from a grub (larva) to an adult.

Hardy (1976, pp. 301–302) reported a sex ratio of Giuliani's dune scarabs at Big

Dune of 1.3 males to 10 females, and Rust (1985, p. 108) reported a ratio of 2.5 males to 10 females. In contrast to these sex ratios, Boyd (2007, p. 3) reported that in a sample of 140 Giuliani's dune scarabs collected at Big Dune, 136 were male and 4 were female. Various factors influence the sex ratio of different samples, such as collection method and timing.

Attempts to quantify adult population structure of Giuliani's dune scarab, including population numbers, have failed (Rust 1985, pp. 106, 108; Murphy 2007, p. 1; Boyd 2010, pp. 3–4). In an unpublished report, Rust (1982, p. 5) estimated that the adult Giuliani's beetle population at Big Dune was between 1,000 and 5,000 individuals, but this estimate was not based on count data. In a survey conducted around the perimeter of Big Dune in 2007, adult Giuliani's dune scarabs were detected at seven of eight survey sites on April 24, and at four of four survey sites on May 1 (Boyd 2010, p. 2). Approximately 800 to 1,000 individual Giuliani's dune scarabs were detected on the April 24 survey and 140 individuals were collected on May 1 (Boyd 2010, pp. 2–3). Approximately 40 individuals were detected at Lava Dune on a May 3, 2007, survey; however, the sampling effort at Lava Dune was much lower than the sampling effort at Big Dune (Boyd 2010, p. 3).

Larval Giuliani's dune scarabs also live beneath plants surrounding the dune. We found no information on when the larvae emerge. Larvae are an average 12 mm (0.5 in) in length and take 2 or more years to fully develop (Rust 1982, p. 6). Only two Giuliani's dune scarab larvae have been recovered and both occurred beneath *Petalonyx thurberi* at a depth of 20 to 40 cm (8 to 16 in) (Rust 1982, p. 5; 1985, p. 108). Larvae feed on accumulated plant debris at the base of shrubs (Rust 1982, pp. 4–5; 1985, p. 108; 1995, p. 6; Boyd 2010, p. 10).

Eggs of Giuliani's dune scarab are oval and measure 3.0 to 3.5 mm (0.25 in) long by 2.5 to 3.0 mm (0.25 in) wide. Females examined in 1982 had an average of 4.2 eggs (Rust 1982, p. 5). We found no information on egg placement; however, it is thought that eggs are deposited in sand near shrub roots (Rust 1982, p. 5).

Summary of Information Pertaining to the Five Factors

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR 424) set forth procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be endangered or threatened based on any of the following 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.

In considering what factors might constitute threats to a species, we must look beyond the exposure of the species to a particular factor to evaluate whether the species may respond to that factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat and, during the status review, we attempt to determine how significant a threat it 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 endangered or threatened as those terms are defined in the Act. This does not necessarily require empirical proof of a significant threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. However, the mere identification of factors that could impact a species negatively is not sufficient to compel a finding that the species warrants listing. The information must include evidence sufficient to suggest that these factors are operative threats that act on the species to the point that the species meets the definition of endangered or threatened under the Act. A species may be endangered or threatened based on the intensity or severity of one operative threat alone or based on the synergistic effect of several operative threats acting in concert.

In making this finding, we have considered and evaluated the best available scientific and commercial information pertaining to the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab. We examined the petition, information in our files, and other published and unpublished literature in relation to the five factors provided in section 4(a)(1) of the Act. Additionally, we solicited information from the public, but did not receive any response. We consulted with biologists from the BLM, the Service, and the Nevada Natural Heritage Program.

Below we summarize the information regarding the status and threats to the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab in relation to the five factors in section 4(a)(1) of the Act.

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

In this section, we describe and evaluate various conditions in relation to the present or threatened destruction, modification, or curtailment of the habitats and ranges of the four beetle species. We identified the following activities as potentially impacting the species' habitats and ranges: Mining, solar development, off-road vehicle recreation, commercial filming, and livestock grazing.

Mining

Mining removes vegetation and soil and alters surface water flows and infiltration of water. Indirect effects of mining, such as establishment of new roads to access mines and increased human presence, cause increased vegetation impacts and beetle displacement. Destruction of vegetation around dunes, disturbance of dune sand, and

disruption of reproductive behavior would reduce or eliminate sand dune beetle populations because the larvae of the beetle use decomposed organic matter as their primary food source and the adults mate on live vegetation.

There are three different types of mineral resources on BLM-administered lands: Locatable (such as iron and gold), leasable (typically oil and gas), and salable (common materials such as sand, gravel, clay, and lava rock) (BLM 2011, p. 10). Locatable minerals are 'claimed,' while leasable and salable minerals are only offered by the BLM upon request.

A mining claim is an administrative action in which a claimant receives a possessory right to the subsurface mineral (BLM 2011a, p. 7). The BLM cannot deny a mining claim because the General Mining Law of 1872 (30 U.S.C. 22 *et seq*.) gives a person a statutory right to the claim. However, a claim does not authorize surface disturbance. In order to extract the mineral, the claimant must file a plan of operation (BLM 2011a, p. 29). An approved plan of operation allows the claimant to obtain surface rights and begin mining operations (BLM 2011a, p. 33).

Once a request to develop (extract) any mineral resource, including locatables, leasables, and salable, the BLM must go through several steps. First, an interdisciplinary team of professional resource specialists (e.g., hydrologists, biologists, geologists, and archeologists) reviews the plan of operation. These specialists are able to make recommendations on project design and implementation to reduce impacts to wildlife, plants, and other resources. Then, the BLM must solicit input from the public and other Federal agencies on the plan of operation, as required under the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq*.). Using this input, the BLM may further amend the project's design and implementation, or it may reject the plan of operation. If the BLM grants the permit for mineral development, it maintains discretion over how and when these operations proceed through the terms of the right-of-way (ROW) grant under Title V of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq*.) and the regulations in parts 2800 and 3000 of title 43 of the Code of Federal Regulations (43 CFR 2800 and 43 CFR 3000).

BLM classifies each of the four dune beetles addressed in this finding as a sensitive species (BLM 2003, p. 6). BLM manages sensitive species in accordance with BLM Manual 6840 Release 6-125, revised on December 12, 2008 (BLM 2008b). BLM defines sensitive species as "species that require special management or considerations to avoid potential future listing" (BLM 2008b, Glossary, p. 5). The stated objective for sensitive species is to initiate proactive conservation measures that reduce or eliminate threats to minimize the likelihood of and need for listing (BLM 2008b, Section 6840.02). Conservation, as it applies to BLM sensitive species, is defined as "the use of programs, plans, and management practices to reduce or eliminate threats affecting the status of the species, or improve the condition of the species' habitat on BLM-administered lands" (BLM 2008b, Glossary, p. 2).

Locatables—The areas around Crescent Dunes and San Antonio Dunes have low

potential for locatable minerals (BLM 1997, Map 32). Historically, there have been no locatable mining claims at Crescent Dunes and four claims at San Antonio Dunes. Currently, there are no locatable mining claims on Crescent Dunes or San Antonio Dunes. In the future, it is possible that mining claims will be filed; however, it is unlikely because the area has low potential for locatable minerals and historically only four claims have been filed. If development of any mining claims is requested, BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

The areas around Big Dune and Lava Dune have no potential for locatable minerals (Castor *et al*. 2006, pp. L2–L3). Prior to 2006, there were 23 mining claims at Big Dune and 26 claims at Lava Dune. All of these were removed after it was determined there was no potential for locatable minerals (see Castor *et al*. 2006, pp. L2–L3).

Although there is no potential for locatable minerals at Lava Dune, currently there are 39 mining claims on Lava Dune that overlap 29 percent of the range of the large aegialian scarab and 40 percent of the range of the Giuliani's dune scarab (BLM serial nos. NMC 916075 to 916093 and NMC 360591 to 360610, filed December 7, 2005). No plans of operation have been filed for any of the mining claims at Lava Dune (BLM 2011b, pp. 1–62). There is no time limit for the claimant to file a plan of operation, and the claim remains in effect as long as the claimant continues to pay the annual BLM maintenance fee.

No mining claims can be filed at Big Dune until the year 2029, because 777 ha (1,920 ac) of land has been closed to mining under Secretarial Order 7737 until that time (74 FR 56657; November 2, 2009). This area represents 71 percent of the range of the large aegialian scarab and 60 percent of the range for the Giuliani's dune scarab. It is possible that mining claims may be filed at Lava Dune; however, it is unlikely because the area has no potential for locatable minerals. If development of any mining claims is requested, BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Leasables—The areas around Crescent Dunes and San Antonio Dunes (BLM 1997, Map 32), Big Dune, and Lava Dune (Castor *et al*. 2006, pp. L2–L3) have a low potential for leasable minerals. Historically, there have been no requests for leasable minerals on Crescent Dunes, Big Dune, and Lava Dune, and two requests on San Antonio Dunes. Currently, there are no leased minerals on Big Dune, Lava Dune, Crescent Dunes, or San Antonio Dunes. In the future, it is possible that requests for leasable minerals may be submitted; however, it is unlikely because the area has low potential for leasable minerals and historically only two requests have been submitted. If any mineral leases are requested, BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Salables— The area around Crescent Dunes is rich in sand. The area around San Antonio Dunes has does not have much sand (Service 2012a). Historically, there has been only one request for development of salable minerals at Crescent Dunes and no requests at San Antonio Dunes. Currently, there are no requests for salable minerals at Crescent Dunes and San Antonio Dunes. It is possible that development of salable minerals may be requested at Crescent Dunes and San Antonio Dunes in the future; however, it is unlikely based on the historical lack of requests for salable minerals in the area. If development of salable minerals is requested, BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Big Dune is rich in sand, while Lava Dune is rich in sand and lava rock. Historically, there has been only one request for salable minerals at Big Dune and two requests at Lava Dune. Currently, there are no requests for salable mineral development on Big Dune.

There is one request to extract lava rock on 74 ha (182 ac) of BLM-administered land at Lava Dune (BLM serial no. NVN 074682). This area represents 11 percent of the range of the large aegialian scarab and 15 percent of the range of the Giuliani's dune scarab. The request and plan of operation for mining lava rock at Lava Dune were submitted on March 9, 2001, and have not been approved or denied. This request to extract lava rock on Lava Dune underwent internal interdisciplinary review in 2005. Although the Service did not provide comments on this proposal, we provided comments on an earlier mining request by the same claimant in the same area. In 1993, we stated, "implementation of the proposed action may result in severe impacts to the candidate species which occur on Big Dune and may threaten their population status" (BLM 2005, p. 1). The BLM only approved mining on the portions of Lava Dune that were not suitable habitat for the large aegialian scarab and Giuliani's dune scarab. In 2005, the BLM wildlife biologists recommended the 2001 request not be approved because the area is suitable habitat for the large aegialian scarab and Giuliani's dune scarab and because of our 1993 comments (BLM 2005, p. 1; 2006, p. 1; 2008, pp. 1–48). During recent discussions, the BLM informed us that the 2001 request is pending analysis under NEPA (BLM 2005, p. 1; 2006, p. 1; Service 2012b, p. 2). After the request has been announced to the public, and after the BLM has considered any public comments submitted on the request, the BLM may grant a ROW to the operator or deny the request. If approved, the BLM has discretion over how and when these operations proceed. Although this request was submitted 11 years ago, there is no time limit for BLM to act on the request under 43 CFR 2900.

In the future, it is possible that requests to develop salable minerals at Big Dune or Lava Dune may be filed because these areas are rich in sand and lava rock, although historically there have been few requests for development of salable minerals in these areas. If requests for development of salable minerals are received, the BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species

policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

There are no active mining operations at Big Dune, Crescent Dunes, or San Antonio Dunes. Although there is one active lava rock mining operation on Lava Dune (Cind-R-Lite 2011, p. 1), the mined area occurs on solid rocky ground of an old volcanic cinder cone (NRCS 2006b, p. 1) and is not suitable habitat for the large aegialian scarab or Giuliani's dune scarab (Service 2011b, p. 3).

Conclusion—We do not consider mining to be a current or future threat to the large aegialian scarab or Giuliani's dune scarab at Big Dune, the Crescent Dunes serican scarab or Crescent Dunes aegialian scarab at Crescent Dunes, or the Crescent Dunes aegialian scarab at San Antonio Dunes because of the low likelihood of mineral development at these areas (the areas are considered to have low mineral potential, there has been a lack of historical requests for minerals in these areas, and there are no current mining applications at these dunes). In addition, before future mining requests could be developed, the BLM would have to evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would be able to provide recommendations to protect these beetles under the NEPA. We conclude that mining at Lava Dune does not constitute a current threat to the large aegialian scarab or Giuliani's dune scarab because the active lava rock mining operation is outside of the range of these two species of beetles, the BLM has not acted on the pending lava rock stockpiling application in 11 years, and no plans of development have been submitted for the gold mining claims. However, if approved, mining lava rock at Lava Dune would remove up to 15 percent of the total range for the Giuliani's dune scarab (Service 2011b, p. 4) and 7.5 percent of the total range for the large aegialian scarab (Service 2012b, pp. 2–3). We do not consider this to be a significant threat because there is no evidence to indicate that the remaining 85 percent of the Giuliani's dune scarab's range and remaining 92.5 percent of the large aegialian scarab's range would be insufficient to support the biological needs of these two beetle species.

Solar Development

Developing land for solar energy projects on or near the dunes may compact and remove both vegetation and sand, alter surface flows and infiltration of water, and affect temperature and wind patterns. Destruction of vegetation around dunes, disturbance of dune sand, and disruption of reproductive behavior would reduce or eliminate sand dune beetle populations because the larvae of the four beetle species use decomposed organic matter as their primary food source and the adults mate on live vegetation. In addition, sand transport processes and other ecological processes that create habitat for these four species of sand dune beetles may be altered by structures blocking the wind (BLM and DOE 2010, pp. 11.7-6, 11.7-8, 11.7-43, 11.7-68, 11.7-115, 11.7-128). Roads and increased human presence associated with solar development result in indirect effects to dune beetles (e.g., roads and increased human presence may result in increased illegal ORV use, which impacts beetle habitat).

There have been no requests for solar development projects at Crescent Dunes or San Antonio Dunes except for the solar project under construction about 1.6 km (1 mi) west of Crescent Dunes. The Crescent Dunes Solar Energy Project is 655 ha (1,619 ac) and is located within the range of the Crescent Dunes aegialian scarab and Crescent Dunes serican scarab (BLM case file no. NVN 086292; BLM 2010, pp. 1–2; 75 FR 81307, December 27, 2010; Service 2012a, pp. 1–8). Construction will remove approximately 607 ha (1,500 ac or 2.3 sq mi), which is 10 percent of the total range of the Crescent Dunes aegialian scarab and 11 percent of the total range of the Crescent Dunes serican scarab. It is unlikely that the Crescent Dunes Solar Energy Project will disrupt sand transport processes at Crescent Dunes because the facility will not block the prevailing winds.

In addition, the BLM has proposed to establish a utility-scale solar energy zone about 8.0 km (5 mi) southwest of Crescent Dunes (Millers Solar Energy Zone). A solar energy zone is a priority area within BLM-administered lands that is suited for utility-scale production of solar energy in accordance with the requirements of the Energy Policy Act of 2005 (42 U.S.C. 13201 *et seq*.) (BLM and DOE 2010, p. 1-8). This proposed solar energy zone would not affect the beetles because it does not overlap the range of either species, and it is unlikely that solar developments within the solar energy zone would disrupt sand transport processes because of the distance from Crescent Dunes and facilities would not block the prevailing winds (Service 2012a, p. 2; Parsons 2010, p. 15).

In the future, it is possible that requests for solar development may be filed at Crescent Dunes and San Antonio dunes; however, if requests for solar development are made, the BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Since 2007, there have been five requests for solar development at Big Dune and none at Lava Dune; however, all the requests at Big Dune have been rescinded. It is possible that solar development projects near Big Dune or Lava Dune may be proposed in the future but at this time, the best available information does not indicate that solar development projects threaten the large aegialian scarab or Giuliani's dune scarab. If requests for solar development are made, the BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Conclusion—We do not consider solar energy development to threaten the Crescent Dunes aegialian scarab or Crescent Dunes serican scarab now or in the future. Although the Crescent Dunes Solar Energy Project will remove up to 10 percent of the total range of the Crescent Dunes aegialian scarab and 11 percent of the total range of the Crescent Dunes serican scarab, we do not consider the project a significant threat to these beetles because there is no evidence to indicate that the remaining 90 and 89 percent, respectively, of their ranges would be insufficient to support the biological needs of these

species, and the project would not significantly alter sand transport processes. The proposed solar energy zone near Crescent Dunes does not overlap the range of either species and would not disrupt sand transport processes. There are no requests for solar development at San Antonio Dunes. We do not consider solar energy development to pose a current threat to the large aegialian scarab or Giuliani's dune scarab because there are no requests for solar development at Big Dune or Lava Dune. It is unknown how many, if any, future requests for solar development would occur in these areas. However, if there are any requests, the BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Off-Road Recreation

Off-road vehicle (ORV) recreationalists currently use both Crescent Dunes and Big Dune for riding and camping. ORV use is prohibited on Lava Dune (BLM 1998, pp. 21, 23–24). Beetle habitat could be impacted by ORV activity that compacts and redistributes sand beneath plants, destroys live vegetation, and prevents the buildup of decomposed organic matter by uncovering dead sticks and leaves from beneath the vegetation. These habitat impacts could reduce or eliminate sand dune beetle populations because the adult and larvae of these four species of beetle only live under and mate on live vegetation and use decomposed organic matter as their primary food source.

Crescent Dunes—Crescent Dunes is located on BLM-administered lands managed by the Tonopah Field Office (formerly the Battle Mountain District Office, Tonopah Resource Area/Field Station prior to 2008). In 1997, the BLM designated 1,214 ha (3,000 ac) at Crescent Dunes, which includes all of Crescent Dune's 402 ha (996 ac), as a Special Recreation Management Area (SRMA) primarily for ORV use. To reduce potential impacts to dune beetles and their habitat, BLM prohibited ORV use on all vegetated sand areas within the Crescent Dunes SRMA (BLM 1997, p. 21). The Crescent Dunes SRMA encompasses 89 percent of the range for the Crescent Dunes aegialian scarab and 100 percent of the range for the Crescent Dunes serican scarab. The beetles live under live vegetation in loose, sandy areas. Illegal ORV riding over vegetation reduces beetle habitat. To estimate the historical loss of vegetation from ORV use immediately surrounding Crescent Dunes, we reviewed aerial photography of the dunes taken between the 1950s and 2010 (Army Map Service 1952; 1954; USGS 1970a; 1970b; Google Earth 1990, 1996, 1997, 2004, and 2010) and conducted a site visit in January 2012. The vegetation density and distribution at Crescent Dunes appears unchanged since the 1950s (Service 2011b, pp. 1–7), and we did not observe any current or historical evidence of illegal ORV use.

San Antonio Dunes—San Antonio Dunes is located on BLM-administered lands managed by the Tonopah Field Office. This area is open to unrestricted vehicle use (BLM 1997, pp. 20–21, Map 20). Although San Antonio Dunes is open to ORV use, these dunes likely receive relatively little use from ORV recreationalists. Because Crescent Dunes provides more open sand and is closer to Tonopah than San Antonio Dunes (approximately half the distance), San Antonio Dunes likely receives less ORV

use than does Crescent Dunes. Additionally, we reviewed high-resolution aerial imagery (Google Earth 2012) and detected no evidence of ORV-user created roads, indicating that ORV use is not heavy at San Antonio Dunes.

Big Dune—Big Dune is located on BLM-administered lands managed by the Pahrump Field Office (formerly a portion of the Las Vegas Field Office prior to 2008) (BLM 1998, p. 3-41). In 1998, the BLM designated 4,694 ha (11,600 ac) around Big Dune as an SRMA, which included all of Big Dune, which is 305 ha (753 ac) (BLM 1998, pp. 21, 23–24). Within the SRMA, BLM identified 777 ha (1,920 ac) of Big Dune as an Area of Critical Environmental Concern (ACEC) to support all species dependent upon dune habitat, with emphasis on the large aegialian scarab and Giuliani's dune scarab (BLM 1988, pp. 1–24; 1998, pp. 7, 11). To reduce potential impacts to dune beetles and their habitat, BLM prohibited ORV use on all vegetated areas within the Big Dune SRMA, including the Big Dune ACEC, except for an 81-ha (200-ac) portion and a 9-ha (23-ac) area that is closed to ORV use for the protection of habitat for the large aegialian scarab and Giuliani's dune scarab (BLM 1998, pp. 21, 23–24). The Big Dune SRMA and Big Dune ACEC encompass 100 percent of the range for the large aegialian scarab and Giuliani's dune scarab at Big Dune, while the closed portions encompass 18 percent of the range for the Giuliani's dune scarab and 7 percent of the range for the large aegialian scarab (Service 2011b, pp. 1–8; 2012b, pp. 1–8).

Illegal ORV riding over vegetation reduces beetle habitat. To estimate the historical loss of vegetation from ORV use immediately surrounding Big Dune, we reviewed aerial photography of the dunes and adjacent areas taken between the 1940s and 2010 (Army Map Service 1948; USGS 1970a; 1970b; Google Earth 1990, 1996, 1997, 2004, and 2010). ORV users have recreated on Big Dune for the past 60 years (Army Map Service 1948). Historical user-created road establishment has resulted in the loss of approximately 61.5 ha (152 ac) of the vegetation immediately surrounding Big Dune (Service 2011b, pp. 1–8). The density of vegetation around Big Dune has been reduced when compared to vegetation 3.25 km (2 mi) south of the dune (Service 2011b, pp. 1–8). Approximately 8,417 vehicles containing 21,042 visitors recreated at Big Dune in 2010 (BLM 2011c, p. 1). To estimate if there were any recent reductions of beetle habitat resulting from ORV use, we reviewed aerial imagery between 1990 and 2010 and conducted 3 site visits. We found the density of vegetation has decreased; however, the distribution of vegetation at Big Dune has changed little (Service 2011b, pp. 1–7), and we observed few current incidents of plants destroyed by illegal ORV activity (Service 2011a, pp. 2, 6; 2011b, pp. 1–7; 2012b, pp. 1–8). Given this information, it does not appear that the total amount of suitable habitat for the large aegialian scarab and Giuliani's dune scarab has been reduced between 1990 and 2010.

Lava Dune—Lava Dune is located on BLM-administered lands and private land. Approximately 90 percent of the dune complex is on lands administered by the BLM, while the remaining 10 percent is owned by a private mining company (Nye County parcel number 000-158-28). ORV use is prohibited on the portion of Lava Dune administered by the BLM (BLM 1998, pp. 21, 23–24). Because ORV riding is prohibited at Lava Dune, we did not review vegetation changes at Lava Dune from ORV use. We

found no information on the frequency of illegal ORV use on the dune, although we observed a set of vehicle tracks on the dune in April 2011 (Service 2011a, pp. 3, 9).

Conclusion—We do not consider legal ORV activity to be a significant threat to any of the four beetle species at this time. ORV activity is prohibited on Lava Dune and restricted to unvegetated slopes within the Big Dune SRMA and the Crescent Dunes SRMA. Each of the four sand dune beetle species considered in this finding is dependent on vegetation for suitable habitat, and unvegetated sand dune slopes are not considered suitable dune beetle habitat. We have no information on dispersal of any of the four dune beetle species or whether ORV activity on unvegetated slopes between patches of suitable habitat affects any of the four species. ORV use has not precluded dune beetle dispersal because even though ORV use has occurred at Crescent Dunes and Big Dune for over 60 years, Crescent Dunes serican scarab and Crescent Dunes aegialian scarab are widely distributed at Crescent Dunes, and large aegialian scarab and Giuliani's dune scarab are widely distributed at Big Dune. ORV activity is not restricted to unvegetated slopes at San Antonio Dunes, but because of their location, these dunes receive relatively little ORV recreational use. Ongoing illegal ORV activity results in some level of impacts to these four species of beetle; however, we do not consider illegal ORV activity to be a significant threat because current illegal ORV use is minimal, and future illegal ORV activity is expected to be minimal based on past use trends.

Commercial Filming

The area around Big Dune is popular for commercial filming and still photography. Since 1993, BLM has issued 19 special use permits for film production at Big Dune (BLM 2011d, pp. 1–15). Permit stipulations limit activities to 10 vehicles carrying 30 people and do not authorize new surface disturbance (BLM 1990, p. 2). No filming is allowed in the dune beetle exclosure areas (BLM 1990, p. 3). We conclude that commercial filming does not pose a significant threat to the survival of these four beetle species now or in the future.

Livestock Grazing

There is no livestock grazing at Big Dune and Lava Dune. Crescent Dunes and San Antonio Dunes are located within an active BLM-designated grazing allotment. We found no information on the amount of or the timing of livestock use. However, the soil around these dune complexes has a low potential for forage (vegetation feed for livestock) (NRCS 1972, pp. 23, 81; NRCS 1998, p. 35). We conclude that livestock grazing is not a significant threat to these four beetle species.

Summary of Factor A

Crescent Dunes aegialian scarab and Crescent Dunes serican scarab—The Crescent Dunes aegialian scarab occurs at Crescent and San Antonio Dunes, and the Crescent Dunes serican scarab occurs at Crescent Dunes. We do not consider ORV activity a significant threat to these beetles. BLM policy restricts ORV use to

unvegetated areas at Crescent Dunes, and these two beetle species are known to occur only under or very close to vegetation. ORV use at San Antonio Dunes is minimal and does not appear to be impacting vegetation (beetle habitat). Current illegal ORV activity at Crescent Dunes is minimal and future illegal ORV activity is expected to be minimal based on past use trends. We do not consider mining a threat to the Crescent Dunes aegialian scarab and Crescent Dunes serican scarab because there are currently no mining applications at these dunes, and it is unlikely future mining applications would be filed because the mineral potential is low. Although the Crescent Dunes Solar Power Project would remove up to 11 percent of the range for these two beetles, there is no evidence indicating that the remaining portion of their ranges would be insufficient to support the biological needs of these two species. It is unknown how many, if any, future requests for development would occur in these areas. However, if there are any requests, the BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA. Based on our assessment of the best scientific and commercial data available concerning present threats to these two beetle species' habitat, we conclude that the present or threatened destruction, modification, or curtailment of their habitat or range is not a threat to the continued existence of these two beetle species.

Large aegialian scarab and Giuliani's dune scarab—The large aegialian scarab and Giuliani's dune scarab occur in two locations: Big Dune and Lava Dune. BLM policy prohibits ORV use at Lava Dune and restricts use to unvegetated areas at Big Dune and these two beetle species are known to occur only under or very close to vegetation. We do not consider illegal ORV activity to be a significant threat to these two beetle species because impacts to dune beetle habitat from current illegal ORV activity is minimal, and future impacts to dune beetle habitat from illegal ORV use is expected to be minimal based on past use trends. If approved, a pending mining application at Lava Dune would remove up to 15 percent of the range for the Giuliani's dune scarab and the large aegialian scarab. However, because this application has been pending for 11 years, we do not consider it an immediate threat. Furthermore, there is no evidence to suggest that the remaining portion of their ranges would be insufficient to support the biological needs of these beetle species. It is unknown how many, if any, future mining requests would occur at Lava Dune. Although there are no solar applications at Big Dune or Lava Dune, it is unknown how many, if any, future requests for solar development would occur in these areas. However, if there are any requests for development, the BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA. Based on our assessment of the best scientific and commercial data available concerning present threats to these two beetle species' habitat and their likely continuation in the future, we conclude that the present or threatened destruction, modification, or curtailment of their habitat or range is not a threat to the continued existence of these two beetle species.

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

There is no available information indicating that the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, or Giuliani's dune scarab is collected for commercial, recreational, scientific, or educational purposes. Pyle *et al*. (1981, p. 241) note that invertebrates generally are not imperiled by overcollection, and that these particular beetle species are not showy and thus less likely to be collected. We conclude that overutilization is not a threat to the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, or Giuliani's dune scarab now or in the future.

Factor C. Disease or Predation

No information is available on the incidence of disease for any of the four beetle species. The only information available on predation is that nighthawks (*Chordeiles* sp.) have been observed preying on adult Giuliani's dune scarabs at Big Dune (Boyd 2010, p. 4; Service 2011a, p. 5). The scarabs were above ground as part of their mating activity, which is thought to be limited to a brief period during evenings in April to May (see "Biology and Population Abundance" section above). Except for this brief period of aboveground mating activity by the Giuliani's dune scarab, the life cycle of this and the other three sand dune beetles occurs below ground. No information is available on predation of the beetles during belowground parts of their life cycle. We conclude that disease or predation is not a threat to any of the four beetle species.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Under this factor, we examine whether existing regulatory mechanisms are inadequate to address the threats to the four dune beetles discussed under the other factors. Section 4(b)(1)(A) of the Endangered Species Act requires the Service to take into account "those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species..." We interpret this language to require the Service to consider relevant Federal, State, and Tribal laws and regulations when developing our threat analyses. Regulatory mechanisms, if they exist, may preclude the need for listing if we determine that such mechanisms adequately address the threats to the species such that listing is not warranted.

The Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab are not protected under Nevada State law because they are classified as insects and not wildlife (NRS 555.265). However, the range of each species occurs on Federal lands managed by the BLM, so protection and management of the habitat for each species is determined by Federal laws, regulations, and policies. Relevant Federal laws, regulations, and policies are summarized below.

Federal Land Policy and Management Act (43 U.S.C. 1701 et seq.)—This Act sets forth the BLM's multiple use mandate and requires that the BLM take any action necessary to prevent impacts greater than those that would normally be expected from an activity in compliance with current standards, in compliance with current regulations, and

implemented using the best reasonably available technology (i.e., undue and unnecessary degradation). The Federal Land Policy and Management Act's implementing regulations, 43 CFR 2800 and 43 CFR 3000, control administration and authorization of ROWs and mineral management, respectively. These regulations require the BLM to reduce environmental impacts from these ROWs to environmental resources, including these four sand dune beetle species.

National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.*)*—The NEPA requires all Federal agencies to formally document, consider, and publicly disclose the environmental impacts of major Federal actions and management decisions significantly affecting the human environment. The NEPA documentation is provided in an environmental impact statement, an environmental assessment, or a categorical exclusion, and may be subject to administrative or judicial appeal. As part of BLM policy, for any mining and solar power plant applications to conduct operations in the Crescent Dunes, San Antonio Dunes, Lava Dune, or Big Dune, an analysis will be conducted to evaluate potential effects to these dune beetles and identify possible project alternatives. The Service would have the opportunity to comment on the project alternatives and provide conservation recommendations to protect these beetles. However, the BLM is not required to select an alternative having the least significant environmental impacts and may select an action that will adversely affect these beetles, provided that these effects are disclosed in their NEPA document.

BLM Policy—The BLM classifies all four beetle species as sensitive species (BLM 2003, p. 6). Under their 6840 manual, BLM is required to manage sensitive species and their habitats to minimize or eliminate threats affecting the species or improve the condition of the species' habitat in order to reduce the likelihood of listing under the Act (BLM 2008, pp. 3, 38). The BLM identified and implemented several management actions that conserve habitat for the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, aegialian scarab, and Giuliani's dune scarab (BLM 1994, pp. 1–427; BLM 1997, pp. 1–193).

The BLM's management action to conserve the Crescent Dunes aegialian scarab and Crescent Dunes serican scarab is the prohibition of ORV use on vegetated sand areas within the Crescent Dunes SRMA (BLM 1997, p. 21). The area is closed to high-speed race events (BLM 1997, p. 20, Map 30). The area is also designated as a ROW avoidance area; however, ROWs can be granted (e.g., solar power plants) if no feasible alternative can be found (BLM 1997, p. 19, Map 22). The area is closed to non-energy leasable minerals and subject to no-surface-occupancy restrictions for fluid leasable minerals (BLM 1997, p. 21, Map 34).

Management actions for the large aegialian scarab and Giuliani's dune scarab include: (1) Prohibition of ORV use on Lava Dune; (2) prohibition of ORV use in vegetated areas within the Big Dune SRMA, including the Big Dune ACEC; (3) maintenance of approximately 777 ha (1,920 ac) of sand dune habitat within the Big Dune ACEC in a natural condition; and (4) prohibition of ORV activity within 90 ha (223 ac) of beetle habitat (BLM 1998, pp. 11, 23). Within the Big Dune ACEC, lands are to

be retained in Federal ownership; ROWs are not allowed; the area is closed to mining; mineral leasing is subject to no-surface-occupancy stipulations; temporary roads must be reclaimed; and competitive high-speed ORV events are prohibited (competitive non-speed events are allowed) (BLM 1998, p. 7). The stipulations protect the beetles from these threats at Big Dune except illegal ORV activity. Solar development is allowed at Lava Dune and outside the ACEC at Big Dune. Mineral development is allowed at Lava Dune.

Therefore, partly as a result of BLM management actions taken as a result of Federal laws, regulations, and policy, we determined under Factor A that mining, solar development, ORV use, commercial filming, and livestock grazing were not significant threats to the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, or Giuliani's dune scarab. Although not protected by State law, we determined under Factor B that collection or any other form of overutilization was not a threat to any of the four beetle species. We also determined that disease or predation was not a threat to any of the four species under Factor C, nor was stochastic events or climate change under Factor E. We therefore conclude that the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab are not currently threatened nor likely to become so as a result of the inadequacy of existing regulatory mechanisms because our analysis under Factors A, B, C, and E determined that there are no significant threats to any of the four species.

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

Stochastic Events

The large aegialian scarab's and Giuliani's dune scarab's ranges are limited to Big Dune and Lava Dune; the Crescent Dunes aegialian scarab's range is limited to Crescent Dunes and San Antonio Dunes; and Crescent Dunes serican scarab's range is limited to Crescent Dunes. Extreme environmental disasters at these areas, such as earthquakes, hurricanes, tornadoes, severe floods, or severe and frequent winter storms, could impact these species through direct mortality or removal of vegetation. However, this area has one of the lowest frequencies of extreme environmental disasters in the United States (DOE 1986, pp. 3-22, 6-27, 6-32), and any extreme weather phenomena occurring in the desert are of such short duration that no significant effects are expected (DOE 1986, pp. 6-27, 6-32). We do not consider extreme environmental disasters a threat to these four beetle species.

Climate Change

Our analyses under the Act include consideration of ongoing and projected changes in climate. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). The term "climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007a, p. 78). The term "climate change" thus refers to a change in

the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007a, p. 78).

Scientific measurements spanning several decades demonstrate that changes in climate are occurring, and that the rate of change has been faster since the 1950s. Examples include warming of the global climate system, 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.) Results of scientific analyses presented by the IPCC show that 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" (defined by the IPCC as 90 percent or higher probability) due to the observed increase in greenhouse gas (GHG) concentrations in the atmosphere as a result of human activities, particularly carbon dioxide emissions from use of fossil fuels (IPCC 2007a, pp. 5–6 and figures SPM.3 and SPM.4; Solomon *et al*. 2007, pp. 21–35). Further confirmation of the role of GHGs comes from analyses by Huber and Knutti (2011, p. 4), who concluded it is extremely likely that approximately 75 percent of global warming since 1950 has been caused by human activities.

Scientists use a variety of climate models, which include consideration of natural processes and variability, as well as various scenarios of potential levels and timing of GHG emissions, to evaluate the causes of changes already observed and to project future changes in temperature and other climate conditions (e.g., Meehl *et al*. 2007, entire; Ganguly *et al*. 2009, pp. 11555, 15558; Prinn *et al*. 2011, pp. 527, 529). All combinations of models and emissions scenarios yield very similar projections of increases in the most common measure of climate change, average global surface temperature (commonly known as global warming), until about 2030. Although projections of the magnitude and rate of warming differ after about 2030, the overall trajectory of all the projections is one of increased global warming through the end of this century, even for the projections based on scenarios that assume that GHG emissions will stabilize or decline. Thus, there is strong scientific support for projections that warming will continue through the 21st century, and that the magnitude and rate of change will be influenced substantially by the extent of GHG emissions (IPCC 2007a, pp. 44–45; Meehl *et al*. 2007, pp. 760–764, 797–811; Ganguly *et al*. 2009, pp. 15555–15558; Prinn *et al*. 2011, pp. 527, 529). (See IPCC 2007b, p. 8, for a summary of other global projections of climate-related changes, such as frequency of heat waves and changes in precipitation. Also see IPCC 2011(entire) for a summary of observations and projections of extreme climate events.)

Various changes in climate may have direct or indirect effects on species. These effects may be positive, neutral, or negative, and they may change over time, depending on the species and other relevant considerations, such as interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). Identifying likely effects often involves aspects of climate change vulnerability analysis. Vulnerability refers to the degree to which a species (or system) is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and

extremes. Vulnerability is a function of the type, magnitude, and rate of climate change and variation to which a species is exposed, its sensitivity, and its adaptive capacity (IPCC 2007a, p. 89; see also Glick *et al.* 2011, pp. 19–22). There is no single method for conducting such analyses that applies to all situations (Glick *et al.* 2011, p. 3). We use our expert judgment and appropriate analytical approaches to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

As is the case with all threats that we assess, even if we conclude that a species is currently affected or is likely to be affected in a negative way by one or more climate-related impacts, it does not necessarily follow that the species meets the definition of an "endangered species" or a "threatened species" under the Act. If a species is listed as endangered or threatened, knowledge regarding the vulnerability of the species to, and known or anticipated impacts from, climate-associated changes in environmental conditions can be used to help devise appropriate strategies for its recovery.

Global climate projections are informative, and, in some cases, the only or the best scientific information available for us to use. However, projected changes in climate and related impacts can vary substantially across and within different regions of the world (e.g., IPCC 2007a, pp. 8–12). Therefore, we use "downscaled" projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for analyses of a given species (see Glick *et al*. 2011, pp. 58–61, for a discussion of downscaling).

We used the web-based tool Climate Wizard to evaluate (1) changes in temperature and precipitation across Nevada during the past 50 years, and (2) projected changes in temperature and precipitation at Crescent Dunes and Big Dune by the 2050s based on 16 general circulation climate models. Across Nevada, temperature has increased by an average of 0.016 degree Celsius (0.029 degree Fahrenheit) per year for a total increase of 0.81 degree Celsius (1.45 degree Fahrenheit) over the past 50 years (*http://www.climatewizard.org/*, accessed April 30, 2012). Precipitation has increased by an average of 0.342 percent per year across Nevada, for a total increase of 17.1 percent over the past 50 years.

For projected changes in temperature and precipitation based on general circulation models, we used Climate Wizard's default setting for emission scenario (the A2 high scenario). At Crescent Dunes, projected increases in temperature by the 2050s range from 1.47 to 3.61 degrees Celsius (2.64 to 6.49 degrees Fahrenheit) across the 16 models, with an average (median) value of 2.88 degrees Celsius (5.18 degrees Fahrenheit) (*http://www.climatewizard.org/*, accessed May 4, 2012). Projected change in precipitation by the 2050s at Crescent Dunes range from a decrease of 30.51 percent to an increase of 19.73 percent across the 16 models, with a median value of 1.73 percent decrease.

At Big Dune, projected increases in temperature by the 2050s range from 1.52 to 3.49 degrees Celsius (2.74 to 6.28 degrees Fahrenheit) across the 16 models, with a

median value of 2.82 degrees Celsius (5.07 degrees Fahrenheit) (*http://www.climatewizard.org/*, accessed May 4, 2012). Projected change in precipitation by the 2050s at Big Dune range from a decrease of 27.90 percent to an increase of 39.79 percent across the 16 models, with a median value of 2.36 percent decrease.

The climate in southwestern North America has been becoming increasingly arid during the past century and is projected to continue to become more arid during the 21st century (Seager *et al*. 2007, entire). Seager *et al*. (2007) modeled aridity as a function of precipitation minus evaporation, and evaporation rates increase as temperature increases. Their study area included the southern two-thirds of Nevada, an area that encompasses the range of each of the four beetle species addressed in this finding. The most severe multiyear droughts that have impacted western North America in the recorded past have been attributed to variations in surface sea temperatures in the tropics, particularly persistent La Nina-like events (USGS 2004, entire; Seager *et al*. 2007, p. 1183). Based on their model results, Seager *et al*. (2007, p. 1184) conclude that droughts in the North American Southwest during this century will become more severe than historical droughts because La Nina conditions will be overlaid on a base condition that is drier than any experienced in recent history.

Climate change will thus clearly affect habitat conditions for the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab. Increases in atmospheric carbon dioxide, air temperature, and evapotranspiration rates will affect vegetation, and each of the four beetle species is dependent on vegetation for its habitat. However, it is difficult to project how climate change will affect overall vegetation structure and composition because certain plant species may increase in response to these changes, while other plant species may decrease. For example, plant species adapted to desert-like conditions may gain a competitive advantage and increase in cover or density. Also, little is known about the biology of any of the four sand dune beetle species, so it is difficult to know how any potential changes in plant species composition would affect dune beetle habitat suitability. While climate change will undoubtedly affect habitat conditions for the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab, there is currently insufficient specific information to conclude that climate change is a significant threat to any of these four beetle species.

Synergistic Interactions Among Threat Factors

We have evaluated individual current and future potential threats to the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab. These species face potential threats from mining, solar development, ORV use, commercial filming, livestock grazing, stochastic events, and climate change. In considering whether the threats to a species may be so great as to warrant listing under the Act, we must look beyond the possible impacts of potential threats in isolation and consider the potential cumulative impacts of all of the threats facing a species.

In making this finding, we considered whether there may be cumulative effects to any of the four dune beetle species from the combined impacts of existing threats such that even if each threat individually does not result in population-level impacts, that cumulatively the effects may be significant. We considered whether the combined effects of mining and solar development may result in a significant impact to any of the four beetle species because mining and solar development each has the potential to result in some level of habitat loss. However, we conclude that synergistic effects between mining and solar development are unlikely to result in a significant overall population impact to any of the four beetle species because the proposed mining and solar development projects occur in different areas and their effects would not overlap. The proposed lava rock mining operation would impact the large aegialian scarab and Giuliani's dune scarab if approved, whereas the Crescent Dunes Solar Energy Project, which is currently being constructed, will impact the Crescent Dunes aegialian scarab and Crescent Dunes serican scarab. ORV use potentially impacts each of the four beetle species, but as a result of BLM policies and management that reduce impacts from ORV use, we conclude that ORV use impacts combined with potential impacts from mining, solar development, commercial filming, and livestock grazing would not be of sufficient severity and scope to result in a significant impact to any of the four dune beetle species. BLM policies and management include prohibition of ORV use anywhere at Lava Dune and within an 81-ha (200-ac) area and a 9-ha (23-ac) area at Big Dune, and restriction of ORV use to unvegetated areas at the rest of Big Dune and all of Crescent Dunes (each of the dune beetle species is known to occur only under or in close proximity to vegetation). Based on its location and lack of evidence of ORV use detected from high-resolution aerial imagery, we believe ORV use at San Antonio Dunes is minimal and thus is unlikely causing a population-level impact to the Crescent Dunes aegialian scarab. As discussed under Factor A, illegal ORV use impacts beetles and their habitat, but we conclude, based on the most current available information, illegal ORV use does not occur with sufficient frequency and geographic scope to cause population-level impacts to any of the four beetle species. It is unknown how many, if any, future requests for mining and solar development would occur in these areas. However, if there are any requests, BLM must evaluate potential effects to these dune beetles and adhere to their sensitive species policy, and the Service would have the opportunity to provide recommendations to protect these beetles under the NEPA.

Synergistic interactions are possible between effects of climate change and effects of other threats such as mining, solar development, ORV use, and livestock grazing. Increases in carbon dioxide, temperature, and evapotranspiration will affect vegetation, and each of the four dune beetle species is closely associated with the presence of vegetation. However, as noted above in the Climate Change section, uncertainty about how different plant species will respond under climate change, combined with uncertainty about how changes in plant species composition would affect suitability of dune beetle habitat, make projecting possible synergistic effects of climate change on the dune beetle species too speculative at this time. At this point in time, given the complex and uncertain nature of effects associated with climate change and the lack of information on the biology on each of these four dune beetle species, we can only conclude that

additional information would be needed to determine whether synergistic interactions between climate change and other threats will impact the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, or Giuliani's dune scarab.

Finding

As required by the Act, we considered the five factors in assessing whether the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab are endangered or threatened throughout all of their ranges. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by these four beetle species.

To ensure that this finding is based on the latest scientific and commercial information on the species, their habitat, and threats occurring, or likely to occur, we examined the petition, information in our files, and other published and unpublished literature. We solicited information from the public, but did not receive any response. We consulted with species and habitat specialists from the BLM, the Service, and NNHP.

Factors potentially affecting the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab include mining, solar development, and ORV use; however, these threats are either limited in scope or significant uncertainty exists about if or how they may impact these species. The inadequacy of existing regulatory mechanisms to prevent any of the above factors is not a significant threat because BLM, by following their policy and through NEPA, has been successful in minimizing manmade threats to these four beetle species. The best available information does not indicate that overutilization, predation, disease, stochastic events, or climate change is a threat to the continued existence of any of these four beetle species now or in the foreseeable future. There is also no evidence to indicate that synergistic or cumulative effects between the factors would result in significant threats to any of these four beetle species.

We find that the threats are not of sufficient imminence, intensity, or magnitude to indicate that the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, or Giuliani's dune scarab is in danger of extinction (endangered) or likely to become endangered within the foreseeable future (threatened), throughout all of its range. Therefore, we find that listing any of these four beetle species as an endangered or threatened species throughout its range is not warranted at this time.

Significant Portion of Its Range

Having determined that the Crescent Dunes aegialian scarab, the Crescent Dunes serican scarab, the large aegialian scarab, and the Giuliani's dune scarab are not endangered or threatened throughout their ranges, we must next consider whether there are any significant portions of their ranges where any of the species is in danger of extinction or is likely to become endangered in the foreseeable future. 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 "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, April 2, 2009); and *WildEarth Guardians* v. *Salazar*, 2010 U.S. Dist. LEXIS 105253 (D. Ariz. September 30, 2010), concerning the Service's 2008 finding on a petition to list the Gunnison's prairie dog (73 FR 6660, February 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." Based on this interpretation and supported by existing case law, the consequence of finding that a species is endangered or threatened in only a significant portion of its range is that the entire species will be listed as endangered or threatened, respectively, and the Act's protections will 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, and as explained further below, 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 and its habitat 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 habitat types 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 or more 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" (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) 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 the species being in danger of extinction in that portion would be sufficient to cause the species in 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 species in 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 or to analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. 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 determination that a species is in danger of extinction in a significant portion of its range 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 to the species occurs only in portions of the species' range that clearly would not meet the biologically based definition of "significant," such portions will not warrant further consideration.

We evaluated the current range of the four beetles to determine if there is any apparent geographic concentration of potential threats for any of the species. The ranges for each of the beetles are relatively small and limited to the local dune system where they are found. We examined potential threats from mining, solar development projects, ORV use, commercial filming, livestock grazing, overutilization, disease or predation, the inadequacy of existing regulatory mechanisms, stochastic events, and climate change. We found no concentration of threats that suggests that any of these four species of dune beetles may be in danger of extinction in a portion of its range. We found no portions of their ranges where potential threats are significantly concentrated or substantially greater than in other portions of their ranges. Therefore, we find that factors affecting each species are essentially uniform throughout their ranges, indicating no portion of the range of any of the four species warrants further consideration of possible endangered or threatened status under the Act. There is no available information indicating that there has been a range contraction for any of the four species, and therefore we find that lost historical range does not constitute a significant portion of the range for the Crescent Dunes aegialian scarab, the Crescent Dunes serican scarab, the large aegialian scarab, or the Giuliani's dune scarab.

We request that you submit any new information concerning the status of, or threats to, the Crescent Dunes aegialian scarab, Crescent Dunes serican scarab, large aegialian scarab, and Giuliani's dune scarab to our Nevada Fish and Wildlife Office (see **ADDRESSES** section) whenever it becomes available. New information will help us monitor these four beetle species and encourage their conservation. If an emergency situation develops for any of these four beetle species, we will act to provide immediate protection.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Nevada Fish and Wildlife Office (see **ADDRESSES** section).

Author(s)

The primary authors of this notice are the staff members of the Nevada Fish and Wildlife Office.

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: _____

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Director, U.S. Fish and Wildlife Service

~~[Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List Six Sand Dune Beetles as Endangered or Threatened]~~