amount received from the sale of the property.

* * * * *

6. Revise § 262.13 to read as follows:

§ 262.13 Removal of obstructions.

A forest officer may remove or have removed a vehicle or other object on National Forest System lands that is abandoned or vandalized or that poses an impediment or hazard to the safety, convenience, or comfort of National Forest visitors.

Dated: May 30, 2008.

Abigail R. Kimball,

Chief.

[FR Doc. E8–16129 Filed 7–16–08; 8:45 am]

BILLING CODE 3410–11–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA–R06–OAR–2006–1029; FRL–8689–8]

Approval and Promulgation of Air Quality Implementation Plans; Texas; Control of Air Pollution From Volatile Organic Compounds

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing to approve a State Implementation Plan (SIP) revision submitted by the State of Texas. This revision, adopted by Texas on November 15, 2006, and submitted to EPA on December 13, 2006, extends requirements to reduce volatile organic compound (VOC) emissions in the Dallas-Fort Worth (DFW) area. Specifically, this revision extends requirements for control of VOC emissions to the five counties that were added to the DFW nonattainment area under the 1997 8-hour ozone standard designation: Ellis, Johnson, Kaufman, Parker, and Rockwall, and the affected VOC sources will be subject to the same emission limitation, control, monitoring, testing, recordkeeping, and recording requirements in effect in Collin, Dallas, Denton, and Tarrant counties. As a result of this action, these new VOC control requirements will be consistent for all nine counties in the DFW ozone nonattainment area. This revision meets statutory and regulatory requirements, and is consistent with EPA's guidance. EPA is approving this revision pursuant to section 110, 116 and part D of the Federal Clean Air Act (CAA).

DATES: Written comments must be received on or before August 18, 2008.

ADDRESSES: Comments may be mailed to Mr. Guy Donaldson, Chief, Air Planning Section (6PD–L), Environmental Protection Agency, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202–2733. Comments may also be submitted electronically or through hand delivery/courier by following the detailed instructions in the Addresses section of the direct final rule located in the rules section of this **Federal Register.**

FOR FURTHER INFORMATION CONTACT: Ellen Belk, Air Planning Section (6PD–L), Multimedia Planning and Permitting Division, U.S. EPA, Region 6, 1445 Ross Avenue, Dallas, Texas 75202–2733, telephone (214) 665–2164; fax number 214–665–7263; e-mail address *belk.ellen@epa.gov.*

SUPPLEMENTARY INFORMATION: In the final rules section of this **Federal Register**, EPA is approving the State's SIP submittal as a direct final rule without prior proposal because the Agency views this as a noncontroversial submittal and anticipates no adverse comments. A detailed rationale for the approval is set forth in the direct final rule. If no relevant adverse comments are received in response to this action, no further activity is contemplated. If EPA receives adverse comments, the direct final rule will be withdrawn and all public comments received will be addressed in a subsequent final rule based on this proposed rule. EPA will not institute a second comment period. Any parties interested in commenting on this action should do so at this time. Please note that if EPA receives adverse comment on an amendment, paragraph, or section of this rule and if that provision may be severed from the remainder of the rule, EPA may adopt as final those provisions of the rule that are not the subject of an adverse comment.

For additional information, see the direct final rule, which is located in the rules section of this **Federal Register**.

Dated: July 1, 2008.

Richard E. Greene,

Regional Administrator, Region 6.

[FR Doc. E8–15728 Filed 7–16–08; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FWS–R8–ES–2008–0081; 92220–1113–0000–C5]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To Delist Astragalus magdalenae var. peirsonii (Peirson's milk-vetch)

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 remove *Astragalus magdalenae* var. *peirsonii* (Peirson's milk-vetch) from the Federal List of Threatened and Endangered Plants under the Endangered Species Act. After reviewing the best scientific and commercial information available, we find that the petitioned action is not warranted. We ask the public to submit to us any new information that becomes available concerning the status of, or threats to, the species. This information will help us monitor and encourage the conservation of this species.

DATES: The finding announced in this document was made on July 17, 2008.

ADDRESSES: This finding is available on the Internet at *http://www.regulations.gov*, *http://www.fws.gov/endangered*, and *http://www.fws.gov/Carlsbad*. Supporting documentation we used in preparing this finding is available for public inspection, by appointment, during normal business hours at the Carlsbad Fish and Wildlife Office, U.S. Fish and Wildlife Service, 6010 Hidden Valley Road, Carlsbad, CA 92011; telephone 760–431–9440; facsimile 760–431–5901. Please submit any new information, materials, comments, or questions concerning this finding to the above street address or via electronic mail (e-mail) at *FW8cfwocomments@fws.gov*.

FOR FURTHER INFORMATION CONTACT: Jim Bartel, Field Supervisor, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office (see **ADDRESSES** section). If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Endangered Species Act (Act) (16 U.S.C. 1531 *et* *seq.*) requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial information to indicate the petitioned action may be warranted. Section 4(b)(3)(B) of the Act requires that within 12 months after receiving a petition to revise the Lists of Threatened and Endangered Wildlife and Plants (Lists) that contains substantial information indicating that the petitioned action may be warranted, the Secretary shall make one of the following findings: (a) The petitioned action is not warranted, (b) the petitioned action is warranted, or (c) the petitioned action is warranted but precluded by pending proposals to determining whether any species is an endangered or threatened species and expeditious progress is being made to add qualified species to, and remove species from, the Lists. Such 12-month findings are to be published promptly in the **Federal Register**.

Astragalus magdalenae var. *peirsonii* (Peirson's milk-vetch) was listed as threatened on October 6, 1998 (63 FR 53596). At the time of listing, the primary threat to *A. magdalenae* var. *peirsonii* was the destruction of individuals and dune habitat from off-highway vehicle (OHV) use and associated recreational development. On October 25, 2001, we received a petition to delist *A. magdalenae* var. *peirsonii* dated October 24, 2001, from David P. Hubbard, Ted J. Griswold, and Philip J. Giacinti, Jr. of Procopio, Cory, Hargreaves & Savitch, LLP, that was prepared for the American Sand Association (ASA), the San Diego Off-Road Coalition, and the Off-Road Business Association (ASA 2001). On September 5, 2003, we announced a 90-day finding in the **Federal Register** that the petition presented substantial information to indicate the petitioned action may be warranted (68 FR 52784). In accordance with section 4(b)(3)(A) of the Act, we completed a status review of the best available scientific and commercial information on the species, and published our 12-month finding on June 4, 2004 (69 FR 31523). We determined that the petitioned action was not warranted at that time.

On July 8, 2005, we received an updated petition to delist *Astragalus magdalenae* var. *peirsonii* (Peirson's milk-vetch) that was prepared by David P. Hubbard for the American Sand Association, the Off-Road Business Association, the San Diego Off-Road Coalition, the California Off-Road Vehicle Association, and the American Motorcycle Association District 37 (ASA 2005). On November 30, 2005, we announced our 90-day finding that the updated petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted, and initiated a status review for *A. magdalenae* var. *peirsonii* (70 FR 71795). The updated petition claims to ''demonstrate, through four years of additional data collection, that the Peirson's milk-vetch is even more abundant than was reported in ASA, et al.'s original petition, and that the plant's population and reproductive capacity are so stable and strong as to warrant delisting'' (ASA 2005, p. 5).

Included again in the updated petition and its associated documents (ASA 2005) is the assertion made in the ASA 2001 petition that *Astragalus magdalenae* var. *peirsonii* was listed without the support of abundance data. That assertion was addressed in our June 4, 2004, 12-month finding (69 FR 31523) on their previous petition to delist *A. magdalenae* var. *peirsonii*, and the updated petition did not provide any additional information that would alter our previous analysis. All of the information in our prior (June 4, 2004) 12-month finding (69 FR 31523) applies to this action, and the status review provided in this document continues to validate that our original decision to list *A. magdalenae* var. *peirsonii* as a threatened species (63 FR 53596) was not made in error or without supporting data.

Species Information

Species Description

Astragalus magdalenae var. *peirsonii* (Peirson's milk-vetch) is an erect to spreading, herbaceous, short-lived perennial in the Fabaceae (Pea family) (Barneby 1959, 1964). Plants may reach 8 to 27 inches (in) (20 to 70 centimeters (cm)) in height and develop taproots (Barneby 1964, pp. 862–863) that penetrate to the deeper, moister sand. According to Phillips and Kennedy (2003), plants largely die back to a root crown in the summer. The stems and leaves are covered with fine, silky appressed hairs. The leaflets, which may fall off in response to drought, are small and widely spaced, giving the plants a brushy appearance. This taxon is unusual in that the terminal leaflet (leaflet at the tip) is continuous with the rachis (the central axis of a compound leaf along which leaflets are attached) rather than articulated with it (Barneby 1959, p. 879; Spellenberg 1993, p. 598). Each flower stalk (classified as a raceme) arises from a point where a leaf joins the stem (axil), and supports 10 to 17 purple flowers (Barneby 1959, p. 879).

Taxonomy

The taxonomic status of *Astragalus magdalenae* var. *peirsonii* was discussed in the final listing rule (63 FR 53596). Although originally described at the species rank, Peirson's milk-vetch is currently recognized at the varietal level as *A. magdalenae* var. *peirsonii* (Spellenberg 1993, p. 598). Although two other recognized varieties exist for *A. magdalenae*, these taxa are restricted to Mexico. However, recent genetic analysis suggests that Barneby's (1964, pp. 862–863) reduction of *A. peirsonii* to varietal status may be inappropriate and that *A. magdalenae* var. *peirsonii* should be recognized as a species [as originally described by Munz and McBurney (Munz 1932, p. 7)] (Porter and Prince 2006, p. 7; 2007, pp. 10–11).

Two other *Astragalus* taxa occur in the vicinity of the Algodones Dunes. They are *A. lentiginosus* var. *borreganus* (Spellenberg 1993, p. 597), easily distinguished by its conspicuously broad leaflets, and *A. insularis* var. *harwoodii* (Spellenberg 1993, p. 594), which is easily distinguished by its smaller stature and shorter banner petals.

Range and Distribution

In the United States, *Astragalus magdalenae* var. *peirsonii* is restricted to specific habitat areas within about 53,000 acres (ac) (21,500 hectares (ha)) in a narrow band running 40 miles (64 kilometers) northwest to southeast along the western portion of the Algodones Dunes (= Imperial Sand Dunes) of eastern Imperial County, California, which is the largest sand dune field in North America. *Astragalus magdalenae* var. *peirsonii* has also been documented from the Gran Desierto of Sonora, Mexico (Felger 2000, p. 300), from an area south and southeast of the Sierra Pinacate lava field, but the Service has no additional information on the extent of area occupied, the size of the population, or its current condition (see 63 FR 53599). *Astragalus magdalenae* var. *peirsonii* was also noted from the Borrego Valley, California, by Barneby (1959, p. 879), but not verified, reproducing population exists (Porter *et al.* 2005, pp. 9–10). Other observations from Yuma, Arizona, and San Felipe, Baja California, Mexico, were based on misidentified specimens (see Porter *et al.* 2005, pp. 9–10, and Phillips *et al.* 2001, p. 7, for detailed accounts).

The Algodones Dunes are often referred to as the Imperial Sand Dunes. Nearly all of the lands in the Algodones Dunes are managed by the Bureau of Land Management (BLM) as the Imperial Sand Dunes Recreation Area

(ISDRA). However, the State of California and private individuals own small inholdings in the dune area. On August 4, 2004, approximately 21,836 ac (8,838 ha) of the 167,800-ac (67,900-ha) ISDRA were designated as critical habitat for *Astragalus magdalenae* var. *peirsonii* (69 FR 47330). In a September 25, 2006, court order, the District Court for the Northern District of California ordered the Service to submit a new final critical habitat rule to the **Federal Register** for publication no later than February 1, 2008 (*Center for Biological Diversity et al.* v. *Bureau of Land Management et al.*, Civ. No. C 03–2509 SI). On February 14, 2008, the Service designated revised critical habitat for *A. magdalenae* var. *peirsonii* (73 FR 8748). In total, approximately 12,105 ac (4,899 ha) in Imperial County, California, fall within the boundaries of the revised designation of critical habitat.

Life History

Astragalus magdalenae var. *peirsonii* has variously been considered an annual or perennial plant (Munz 1932, p. 7; 1974, p. 432; Barneby 1959, p. 879; 1964, p. 862; Spellenberg 1993, p. 598; Willoughby 2001, p. 21; Porter *et al.* 2005, p. 7). Willoughby (2001, p. 21) observed that *A. magdalenae* var. *peirsonii* is a short-lived perennial and, as such, its response to rainfall was predictable. Recent evidence confirms this observation (Phillips and Kennedy 2004, p. 5; Groom *et al.* 2007, p. 121) and that, depending upon conditions and germinating time, *A. magdalenae* var. *peirsonii* is capable of flowering before it is a year old (Barneby 1964, p. 862; Romspert and Burk 1979 p. 16; Phillips *et al.* 2001, p. 10; Phillips and Kennedy 2005, p. 22; Porter *et al.* 2005, p. 31).

Based on current understanding of the species' life history, sufficient rain in conjunction with cool fall temperatures appears to trigger germination events. Seedlings are often present in suitable habitat throughout the dunes, especially during above-normal precipitation years. In intervening dry years, plant numbers decrease as individuals die and are not replaced by new seedlings. Porter *et al.* (2005, p. 35) estimated that a total or near-total failure of seedling recruitment occurs 20 percent of the time (once every 5 years). This species likely depends on the production of seeds in the wetter years and the persistence of the seed bank from previous years to survive until appropriate conditions for germination occur again. However, individual plants that perennate (i.e., survive from year to year with a period of reduced activity) likely give ''continuity'' to the presence of *Astragalus magdalenae* var. *peirsonii* through years of low recruitment (Beatley 1970, p. 331).

If winter rains begin in early November, seeds germinating in early December may develop rapidly to produce flowering plants by February and set seed in March (Barneby 1964, p. 862; Romspert and Burk 1979, pp. 15–16). In wetter years, a second germination event may occur in late winter (Phillips *et al.* 2001, p. 10; Phillips and Kennedy 2005, p. 22), but these plants often fail to reproduce and die in large numbers at the onset of summer drought (Phillips *et al.* 2001, p. 10; Phillips and Kennedy 2003, p. 20). If winter rains do not occur until late January, sufficient soil moisture or time may not exist for young plants to develop the root structure needed to flower and set seeds before the onset of desiccating summer heat. Young plants often die during summer drought in significant numbers probably because such plants lack a sufficiently developed root system to tap water at lower horizons, i.e. deeper soil layers. Older plants also die during this period. However, some plants develop an adequate root system and perennate to live 2 to 3 years. Some perennial individuals will flower and produce seeds in years with no precipitation (Phillips and Kennedy 2006, pp. 5, 9; USFWS 2007, pp. 13, 15), thereby assuring the continuity of the seed bank. Years with optimal or prolonged precipitation may experience two or more germinations and increased seed production (Phillips and Kennedy 2005, p. 20).

Plants, regardless of age, may flower from as early as mid-November through May (Barneby 1964, p. 862; Phillips and Kennedy 2002, p. 2; Porter *et al.* 2005, p. 11). The onset of germination and flowering are expected to vary from year to year depending upon the timing of winter rains. As a result, the life stages are coincident with cooler temperatures and a likely hydrated dune substrate. Barneby (1964, p. 862), Phillips and Kennedy (2005, p. 22), and Porter *et al.* (2005, p. 34) recorded plants that germinate in November can produce fruit in as little as 3 months. Mature fruits are found on plants from the beginning of February to late June (Phillips and Kennedy 2005, p. 13; Porter *et al.* 2005, pp. 22–24; Romspert and Burk 1979, p. 16), with peak production occurring in March and April (USFWS 2007, Figure 6).

Not all plants, even those seemingly capable of flowering and even under favorable conditions, flower in a given year (Phillips and Kennedy 2003, p. 20; Willoughby 2005b, p. 11; USFWS 2007, p. 15). In 2005, the BLM surveys recorded that 75 percent of all plants counted flowered (Willoughby 2005b, p. 11), while the Service recorded 54 percent of plants flowered during the 2006 surveys (USFWS 2007, p. 15). Smaller first season specimens, if flowering, produce relatively few flowers and contribute little to the seed bank of *Astragalus magdalenae* var. *peirsonii* compared with larger, older individuals that have more flowers (Romspert and Burk 1979, p. 19; Phillips and Kennedy 2005, p. 20). In low rainfall years, the reproductive output of older plants may range from as few as one seed pod to hundreds of pods per plant (Phillips and Kennedy 2005, pp. 16–17; USFWS 2007, p. 15). Phillips and Kennedy (2002, p. 27) estimated that plants counted in the spring 2001 survey averaged five fruits per plant. From a small sample in winter 2001–2002, they calculated that plants about 6 months older had an average of 171 fruits per plant (Phillips and Kennedy 2002, p. 27). In the 2006 survey, the Service calculated the median number of pods per plant on plants more than 1 year old at 139 (USFWS 2007, p. 15).

Pollination and Breeding System

Porter *et al.* (2005, p. 32) identified a white-faced, medium-sized, solitary bee (*Habropoda pallida*) as the only effective pollinator of *Astragalus magdalenae* var. *peirsonii*. Otherwise, little is known about the pollination ecology of *A. magdalenae* var. *peirsonii*. Porter *et al.*'s (2005, p. 34) preliminary experiments in the field and under greenhouse conditions indicate that *A. magdalenae* var. *peirsonii* plants are not capable of self-pollination, and thus require pollinators for outcrossing. Moreover, Porter *et al.* (2005, p. 34) reported from microscopic examination of hand-pollinated flowers that pollen from the same flowers did not adhere to the stigmatic surface, while pollen from another plant did adhere. Unless pollen grains adhere, fertilization cannot occur. These results indicate that *A. magdalenae* var. *peirsonii* exhibits traits consistent with self-incompatibility (Porter and Prince 2007, pp. 10–11). Self-incompatibility (SI) is a genetic mechanism in plants that prevents self-fertilization, or fertilization by pollen from plants that share the same SI allele. This means that inbreeding depression is avoided because only pollen from plants that do not share SI alleles with the maternal plant will be able to successfully fertilize eggs (Frankham *et al.* 2002, pp. 37–38; Castric and Vekemans 2004, p. 2873). This observation is a significant consideration for assessing the adequacy of population size, structure, and function. Large populations of standing individuals, with high SI allele diversity, are likely necessary to provide adequate numbers of individuals that can potentially fertilize the available eggs and ensure that seed is produced. In the Algodones Dunes, large SI allele diversity may be necessary spatially across the dunes, and temporally through periods of drought. Further research and modeling are necessary to better understand the dynamics of the *A. magdalenae* var. *peirsonii* breeding system and how the species may be responding to natural and man-made disturbances within its range.

Seed Biology

Seed development. The fruits or pods of *Astragalus magdalenae* var. *peirsonii* are 0.8 to 1.4 in (2 to 3.5 cm) long, single-chambered, hollow, and inflated. Developing pods contain 11 to 16 ovules (structures containing immature eggs, or seeds, prior to fertilization) (Barneby 1964, p. 862). The seeds, among the largest seeds of any *Astragalus* in North America (Barneby 1964, pp. 862–863), average less than 0.1 ounce (oz) (15 milligrams (mg)) each in weight and are up to 0.2 in (4.7 millimeters (mm)) in length (Bowers 1996, p. 69; McKinney *et al.* 2006, p. 85).

Only a portion of a pod's ovules develop into mature seeds. Some desiccate, while others are lost to insects (McKinney *et al.* 2006, p. 85). Seeds are either dispersed locally by falling from partly opened fruits (pods) retained on the parent plant or disperse over greater distances by their release from fruits (pods) blown across the sand after falling from the parent plant.

Seed germination. Astragalus magdalenae var. *peirsonii* seeds require no pre-treatment to induce germination, but germination success improved dramatically when the outer seed coat was scarified (e.g., scratched, chipped). Porter *et al.* (2005, p. 29) reported about 99.1 percent of scarified seeds germinated in laboratory trials, while only 5.3 percent of unscarified seeds germinated. However, in artificial dune experiments, Porter *et al.* (2005, p. 29) reported the germination rate dropped to 27 percent. In germination trials conducted by Romspert and Burk (1979, pp. 45–46), 92 percent or more seeds germinated within 29 days at temperatures of 77 °F (25 °C) or less, and no seeds germinated at temperatures of 86 °F (30 °C) or higher. This observation indicates that seeds on the dunes likely germinate in the cooler months of the year. Porter *et al.* (2005, p. 29) identified the primary dormancy mechanism in *A. magdalenae* var. *peirsonii* is the impermeability of the seed coat to water and demonstrated little loss of viability in seeds stored for 5 years. Impermeability of the seed coat to water as a dormancy mechanism is consistent with species having a seed bank (Given 1994, p. 67; Bowers 1996, p. 71). Dispersed seeds that do not germinate during the subsequent growing season become part of the soil seed bank (Given 1994, p. 67).

Annual or short-lived perennial plant populations can fluctuate between large numbers of plants to few or even no plants. Many species, and *Astragalus magdalenae* var. *peirsonii* may be one of them, rely on periodic "rescue" episodes from the seed bank where large numbers of plants germinate when conditions are suitable (Elzinga *et al.* 1998, p. 285; Pake and Venable 1996, pp. 1433–1434). Lincoln *et al.* (1993, p. 223) define the soil seed bank as "the store of dormant seed buried in soil," the store of seeds that do not germinate when otherwise adequate conditions are present. The number of seeds in the seed bank changes, depending upon the balance between processes or factors that remove seeds from the seed bank and those that contribute seeds to it. Deposition to the *A. magdalenae* var. *peirsonii* seed bank depends upon standing plants that successfully produce seeds. This deposition is diminished to the extent that plants are precluded from adding seeds to the seed bank (Harper 1977, pp. 457–468; Louda and Potvin 1995, pp. 240–243). Other decreases to the seed bank can be attributed to loss of plants or reduced reproductive output due to herbivory (Louda 1982, pp. 47–49; Baron and Bros 2005, pp. 49–51), direct or indirect OHV damage (Pavlik 1979, pp. 73–85), or environmental conditions (e.g., summer or winter drought, wind blown sand damage, dune shifts, or deep burial) (Baskin and Baskin 2001, pp. 149–160). Increases in the available seed bank can be attributed to rescue episodes in years favorable for reproduction (Pake and Venable 1996, p. 1434).

Development of a seed bank and the associated dormancy allows plant species to grow, flower, and set seed in years with most favorable conditions (Given 1994, p. 67). When measuring seed bank dynamics, estimations of the rate of seed mortality and aging, the amount of seed lost to predators, and the variability in germination events are among the information considered necessary to determine the viability and productivity of a seed bank (Elzinga *et al.* 1998, p. 284).

Abundance and Population Trend

The updated petition (ASA 2005, pp. 11–12, 38–46) asserts that *Astragalus magdalenae* var. *peirsonii* is abundant and thriving, and therefore should not be listed, and also again asserts that the original listing (63 FR 53596) was made without the support of abundance data. In fact, for a species that fluctuates widely in numbers from year to year, an assessment of abundance may not be the most meaningful measure of the likelihood of persistence. Assessing the population trend, resilience, and long-term viability of *A. magdalenae* var. *peirsonii* is more relevant but is complex due to (1) the large fluctuations in numbers of above-ground plants from year to year (often the result of variations in rainfall or other climate conditions from year to year), and (2) the intricacies associated with studying and understanding seed banks and their dynamics. Although abundance data will not likely completely clarify the likelihood of persistence for *A. magdalenae* var. *peirsonii*, we review the available data below because it has been the subject of much discussion over recent years. The data presented in this section supports our original decision to list *A. magdalenae* var. *peirsonii* as threatened. In addition, we discuss the suitability of comparing available surveys. This is relevant because multiple years of survey data are needed to detect population trends, and using data from different surveys together to detect a trend can only be legitimately done if the survey methodologies are comparable. Finally, we discuss the available data on seed production and seed bank dynamics, which is also relevant to our analysis of the long-term persistence of *A. magdalenae* var. *peirsonii*.

Overview of survey data. A number of abundance surveys have been conducted for *Astragalus magdalenae* var. *peirsonii*. Early surveys incorporated a methodology whereby plants encountered along driving or walking transects covering the entire 167,000 ac (67,900 ha) ISDRA were qualitatively indexed to an abundance value (see WESTEC 1977, Table 2–3) and represented in quadrants measuring 0.45 mile on each side. Analysis of these coarse, dune-wide surveys conducted by WESTEC in 1977, and BLM (Willoughby) in 1998 through 2002, could only provide relative comparisons of mean abundance values between years. In comparing survey results for these years, the species was most abundant in 1998, the highest rainfall year, and least abundant in 2000, the lowest rainfall year (Willoughby 2001,

p. 21; 2004, p. 10). Mean abundance values for the years 1998 through 2002 were based upon total plant counts ranging from 86 plants in 2000 to 5,930 plants in 2001 (Willoughby 2004, p. 36). From this comparative analysis, Willoughby (2004, p. 26) determined that there was little change in *A. magdalenae* var. *peirsonii* abundance between 1977 and 2002.

In 2001, Dr. Arthur M. Phillips began a multi-year effort to monitor *Astragalus magdalenae* var. *peirsonii*. *Astragalus magdalenae* var. *peirsonii* abundance values were tabulated for 4 years: 2001, 2003, 2005, and 2006. In 2001, during an initial reconnaissance of the dunes, Phillips *et al.* (2001, p. 6) counted 71,926 *A. magdalenae* var. *peirsonii* from 127 specific locations covering an unspecified area of about 35,000 ac (14,165 ha) (Phillips and Kennedy 2002, p. 8, Appendix A), and they therefore calculated a density of about 2 plants/ac (5/ha). From the 127 locations, Phillips and Kennedy (2002, p. 10) selected 25 monitoring sites to use for the multi-year effort. The effective area (i.e., the total area represented by data) covered by the 25 sites was about 138 ac (56 ha) (Phillips and Kennedy 2005, p. 9). Phillips and Kennedy reported 30,771 plants in 2001 (Phillips and Kennedy 2002, Appendix A); 33,202 plants in 2003 (Phillips and Kennedy 2003, Appendix A); 77,922 plants in 2005 (Phillips and Kennedy 2005, p. 10); and 1,233 plants in 2006 (Phillips and Kennedy 2006, p. 6) for these 25 monitoring sites. Plant density ranged from 565 plants/ac (1,392/ha) in 2005, to 8.9 plants/ac (22/ha) in 2006. In addition, in 2005 and 2006, Phillips and Kennedy used the data from the 25 monitoring sites to estimate the population for 60 of their original sites at 173,328 and 2,035, respectively (Phillips and Kennedy 2005, p. 11; 2006, p. 6).

The BLM embarked on a new sampling methodology in 2004 that sampled a larger portion of the dunes in greater detail (Willoughby 2005a, pp. 1–5), and increased the number of sample transects from 135 in 2004 to 510 for the spring 2005 surveys (Willoughby 2005b, p. 2). Willoughby's (2005a and 2005b) analyses were based upon these sample transects, which were comprised of 37,169 25-by-25-meter sample cells in 2004 (USFWS 2006a, Table 1) and 123,488 sample cells in 2005 (USFWS 2006b, Table 1). Willoughby (2005a, Table 1–1) estimated the total population size at 286,374 plants in 2004, for an estimated density of 5.5 plants/ac (13.5/ha). Plants were most abundant in 2005 in what was an exceptional year with well-timed rainfall and cool temperatures from October 2004 through March 2005 (Willoughby 2005b, p. 6). In 2005, Willoughby (2005b, Table 4) estimated 1,831,076 plants were in the dunes, with an estimated density of 35 plants/ac (86.3/ha). A randomized sample of 2005-occupied cells during the very dry winter and spring of 2006 yielded an estimated population size of 83,451 plants, or 1.5 plants/ac (3.9/ha) (Willoughby 2006, p. 6). The effective area of these surveys covered about 53,000 ac (21,200 ha) and encompassed all BLM management areas containing *Astragalus magdalenae* var. *peirsonii*. In 2007, the BLM estimated the population size as 293,102 plants, or 14.2 plants/ac (35/ha), for portions of the Gecko, AMA and Ogilby management areas, with an effective area of 20,692 ac (8,374 ha) (Willoughby 2007, Table 5). However, the precision of the 2006 and 2007 population estimates was poor due to the low numbers of plants sampled and their spatial variability (Willoughby 2006, p. vi; 2007, p. 11).

The disparity among these three survey methods and the data collected make it difficult to assess the *Astragalus magdalenae* var. *peirsonii* population. As presented in Table 1 below, the 2005 survey conducted by BLM is the most extensive and precise effort to determine overall population abundance and distribution. The amount of data gathered in 2005 was the result of an exceptionally good rainfall year and an extraordinary monitoring effort, and represents the best estimate of the potential population and extent of habitat for *A. magdalenae* var. *peirsonii*. The year 2006 was exceptionally dry, with no reported *A. magdalenae* var. *peirsonii* germination and few surviving plants from 2005. The 2007 rainfall pattern was not evenly distributed throughout the dunes and contributed to the spatial variability that yielded poor precision for the population estimates of that year (Willoughby 2007, pp. 6–7 and Table 2).

TABLE 1.—ABUNDANCE VALUES SUBMITTED FOR *A. Magdalenae* VAR. *Peirsonii* IN THE ALGODONES DUNES IN 14 UNPUBLISHED REPORTS

Year	Surveyor	No. plants counted	Estimated population	$\bar{x}$ abundance class	No. samples	Effective area
1977	WESTEC	N/A	N/A	4.3	1,611	167,800 ac (67,900 ha).
1998	BLM [1]	5,064	N/A	6.3	542	167,800 ac (67,900 ha).
1999	BLM [1]	942	N/A	2.8	542	167,800 ac (67,900 ha).
2000	BLM [1]	86	N/A	1.1	542	167,800 ac (67,900 ha).
2001	BLM [1]	5,930	N/A	4.7	542	167,800 ac (67,900 ha).
2002	BLM [1]	2,297	N/A	3.3	542	167,800 ac (67,900 ha).
2001	Phillips [2]	[3] 71,926	N/A		127	35,000 ac (14,165 ha).
2001	Phillips [2]	30,771	N/A		25	138 ac (56 ha).
2003	Phillips [2]	33,202	N/A		25	138 ac (56 ha).
2005	Phillips [2]	77,922	[4] 173,328		25	138 ac (56 ha).
2006	Phillips [2]	1,233	[4] 2,035		25	138 ac (56 ha).
2004	BLM [1]	25,798	286,374		135	53,000 ac (21,200 ha).
2005	BLM [1]	739,805	1,831,076		510	53,000 ac (21,200 ha).
2006	BLM [1]	761	83,451		775	53,000 ac (21,200 ha).
2007	BLM [1]	1,435	293,102		735	20,692 ac (8,374 ha).

[1] BLM reports cited as Willoughby.
[2] Phillips reports cited as Phillips et al. or Phillips and Kennedy.
[3] Reconnaissance of unspecified area.
[4] Estimated population for 60 specific sample sites.

As illustrated in Table 1, two substantial issues are associated with the body of survey work for *Astragalus magdalenae* var. *peirsonii*. These two issues are (1) comparison of BLM data with WESTEC data and (2) interpretation of abundance values. Each issue is discussed below.

Comparison of BLM data with WESTEC data. The first issue concerns the early surveys conducted between 1977 and 2002. Although mean abundance class values were calculated from sample transects across the entire dunes, class values were only comparable between years. It is not appropriate to compare these class values with more recent or finer scale data that is based on counts of plants (rather than abundance classes). Willoughby (2000, p. 7) recognized that the 1998 BLM data, and the data BLM collected through 2002, might not be directly comparable to the 1977 (WESTEC 1977) data (Willoughby 2000, p. 7). Therefore, he (Willoughby 2000, p. 34, and reiterated 2001, p. 28) addressed the limitations of the monitoring data to that point in time by recognizing that statistically significant sample values between 1977 and 1998 were not ''proof'' that *Astragalus magdalenae* var. *peirsonii* had increased significantly. Our assessment of the data indicates that the density classes of WESTEC (1977) and BLM (Willoughby 1998–2002) are qualitative and are not based on particular numbers of individual plants but rather on the apparent visual density of plants as a feature of the landscape. These reports (WESTEC 1977 and BLM 1998–2002) do not include quantitative measures of density, based upon counts of numbers of plants per unit area. We are not aware of any quantitative measures of density for *A. magdalenae* var. *peirsonii* for the years included in these reports.

Although Willoughby (2000, p. 7) noted the limitations of the WESTEC (1977) data, he converted the qualitative measures into quantitative measures for comparison with the BLM survey data in an attempt to assess abundance among years. The magnitude of non-sampling error (subjective errors arising from activities other than sampling or measuring) in the WESTEC (1977) study, however, makes comparison with the BLM data problematic (L. Ball USFWS *in litt*. 2003, p. 2, comment for ASA (2001) petition). In addition, peer reviewers also commented on the inappropriateness of comparisons between the BLM study results and those of WESTEC (1977). In his peer review comments for the ASA (2001) petition, Pavlik (*in litt*. 2003, p. 3, comment for ASA (2001) petition) stated that ''[a]ny attempt to establish population trends by comparison to the 1977 WESTEC study should be rejected because there is no objective way to replicate with certainty WESTEC's vague and highly subjective relative abundance codes'' (see WESTEC 1977, Table 2–3).

Climatic variability should also be considered when comparing the 1977 WESTEC study with more recent surveys. Pavlik (*in litt*. 2003, p. 4, comment for ASA (2001) petition) stated that rainfall during the October through March period, most critical for germination, was less in 1977 than in 1998, and, therefore, if more plants were present in 1998, it could have been due to increased rainfall rather than lack of OHV impacts. He noted that this was stated explicitly in Willoughby (2000, p. 34), but not in ASA (2001). In her peer review, Bowers (*in litt*. 2006) noted that the updated petition (ASA 2005, p. 36) stated that despite increasing OHV traffic, *Astragalus magdalenae* var. *peirsonii* rebounded after the 1977 survey made by WESTEC. Bowers (*in litt*. 2006, pp. 6–7) stated that:

> at the time of the 1977 surveys, when PMV [*A. magdalenae* var. *peirsonii*] was apparently at a low ebb, the southwestern United States had only recently emerged from a long and serious drought [see Swetnam and Betancourt 1998, p. 3131]. This suggests that under relatively light OHV use, PMV is sensitive to severe drought. The post-1977 increase in PMV occurred during the wettest two decades in the twentieth century. In fact, the period from 1976 to 1998 was among the wettest during the past one thousand years [see Swetnam and Betancourt 1998, pp. 3140–3141; Willoughby 2006, Figure 3]. This suggests that PMV thrived under increasing OHV pressure only because climate favored regeneration. I cannot emphasize too strongly that our belief in the resilience of this species is biased by unusually favorable conditions for reproduction in recent years.

Kalisz and McPeet (1993, p. 319) note that multiple years of poor conditions magnify this impact on population growth rates and the dormant seed bank.

Therefore, the information available to us indicates that using the WESTEC data, in comparison with other data, to assess abundance trends in *Astragalus magdalenae* var. *peirsonii* is inappropriate. This suggests that claims of trends of population increases based on comparisons of BLM surveys (Willoughby 2000, 2001, and 2004) and the WESTEC survey (1977) are not supportable, both because the surveys are not comparable due to differences in methodology and because of climatic variability between the years surveyed (i.e., any increases observed could be due to increases in rainfall in later years rather than to actual increases in numbers of plants). At the time of listing in 1998, the available data (WESTEC 1977) indicated that *A. magdalenae* var. *peirsonii* was not abundant within the Algodones Dunes, and an analysis of threats to the species, in light of the species' life history traits, indicated that listing the species as threatened was warranted.

Interpretation of abundance values. The second issue associated with the survey work for *Astragalus magdalenae* var. *peirsonii* concerns the abundance values reported from 2001 through 2006 by Phillips *et al.* (2001), Phillips and Kennedy (2003, 2005, and 2006), and Willoughby (2005a, 2005b, 2006, and 2007). The Phillips reports (Phillips *et al.* (2001), Phillips and Kennedy (2003, 2005, and 2006)) and the BLM reports (Willoughby (2005a, 2005b, 2006, and 2007)) used different sampling protocols and estimation procedures. Because the methodologies for these surveys differed from one another, caution should be used in comparing them. Phillips *et al.*'s (2001) reconnaissance covered an unspecified large area, but observations were reported from only 127 locations (Phillips *et al.* (2001, Appendix A). The 25 monitoring sites established by Phillips and Kennedy (2001, 2002) were subjectively selected for *A. magdalenae* var. *peirsonii* presence and not designed to estimate abundance beyond the extent of the 138–ac (56–ha) sampling area (Phillips and Kennedy 2002, p. 10). In contrast, the BLM surveys were designed to estimate the standing *A. magdalenae* var. *peirsonii* population (Willoughby 2005a, 2005b, 2006) throughout its entire range in the dunes. Data were compiled in 25-by-25-meter cells derived from transects totaling 577 mi (930 km) in 2004 (Willoughby 2005a, Table 1) and 1,922 mi (3,095 km) in 2005 (Willoughby 2005b, Table 1), covering the full length of the dunes and sampling all micro-habitats along each transect (Willoughby 2005b, pp. 1–3).

According to the updated petition, the survey method used by Phillips *et al.* (2001) ''eliminated the need for a sampling methodology and statistical extrapolations'' because they counted every plant encountered (ASA 2005, p. 41; Phillips *et al.* 2001, p. 3). At each sample site, ''relatively dense'' clusters that best fit the requirements of the sampling design were systematically sampled (Phillips and Kennedy 2002, p. 10). In assessing the Phillips survey efforts conducted to date, we focused on Phillips *et al.* (2001) because this study was the basis for all subsequent field studies conducted by Phillips and Kennedy. Monitoring sites which would be sampled repeatedly over several years (Phillips and Kennedy 2002 through 2006) were randomly chosen from 60 areas designated as sites in Phillips *et al.* (2001). Twenty-five sites (40 percent of designated sites) were selected.

As routinely cautioned against in standard sampling or monitoring protocols (e.g., Elzinga *et al.* 1998, p. 64; Thompson *et al.* 1998, p. 12; Morrison *et al.* 2002, pp. 62–63; Ott and Longnecker 2001, p. 21), or protocols for assessing demographics and censusing rare plants (e.g., Falk and Holsinger 1991, pp. 225–238; Pavlik and Barbour 1988, pp. 218–224; others as noted in Porter *in litt.* 2003, p. 1, comment for ASA (2001) petition), this sampling methodology is subject to introduced selection error. Kalisz (*in litt.* 2006, p. 6), Converse (*in litt.* 2006, pp. 2–4), and Porter (*in litt.* 2003, pp. 1–5, comment for ASA (2001) petition) commented in their peer reviews on the inappropriate methodology used by Phillips and Kennedy. Specifically, Converse (*in litt.* 2006, p. 4) noted that Phillips and Kennedy (2005) calculated plant density ''not for a pre-selected area, but for areas that were found to have concentrated numbers of plants, thus leading to seriously inflated estimates.'' In fact, density values reported by Phillips and Kennedy (2005) and Willoughby (2005b) are consistent with the concern that Phillips and Kennedy's estimates may be inflated. Phillips and Kennedy (2005, p. 11) estimated plant densities of 0.18 to 0.78 plants per square meter (1,800 to 7,800 plants per hectare or 728 to 3,156 plants per acre) as compared to Willoughby's (2005b, p. v.) 2005 estimates of 9 to 53 plants per acre (22 to 132 plants/ha). Only 0.1 percent of the 37,169 cells sampled by BLM in 2004 had a density equal to or greater than 1,800 plants/ha (USFWS 2006a), and 1 percent of the 123,488 cells sampled by BLM in 2005 contained a density equal to or greater than 1,800 plants/ha (USFWS 2006b).

The updated petition asserted that plant counts conducted from 1998 to 2005 by Phillips and Kennedy and BLM confirm that the Imperial Sand Dunes support more than 100,000 individual *Astragalus magdalenae* var. *peirsonii* and confirm that *A. magdalenae* var. *peirsonii* is abundant and thriving throughout the dunes (ASA 2005, p. 46). As noted above, there are weaknesses in the sampling methodology used in Phillips and Kennedy (2002, 2003, 2004, 2005, and 2006). These weaknesses affect the reliability of the estimates presented in the Phillips and Kennedy reports (2002, 2003, 2004, 2005, and 2006). However, we do not disagree with the updated petition that the Imperial Sand Dunes can support 100,000 or more individual *A. magdalenae* var. *peirsonii* plants. The BLM surveys of 2005 confirm this point (USFWS 2006b, Table 2; Willoughby 2005, p. 25).

Distribution of Astragalus magdalenae var. *peirsonii in the Algodones Dunes.* The updated petition (ASA 2005, p. 23) cites Phillips *et al.* (2001, p. 13) in qualitatively assessing the presence and abundance of *Astragalus magdalenae* var. *peirsonii* in open versus closed areas. Phillips *et al.* (2001, p. 4) stated that a ''general reconnaissance of virtually all portions of the dunes outside of the administrative closures and wilderness area was performed'' and that ''specific survey areas were selected and intensively searched for occurrences.'' Phillips *et al.* (2001, p. 13), in this reconnaissance, state that they observed *A. magdalenae* var. *peirsonii* colonies that ''appeared to be similar in number and abundance'' in both the open and closed areas of the dunes. However, this statement is inconsistent with other portions of the report. For example, the report also states that the ''area with dense occurrences in the large central closure was perhaps twice the size of the area with sites south of the closure and north of I–8. Although no counts were possible from the helicopter, many sites with large numbers of plants were observed within the closure.'' Phillips and Kennedy (2005, p. 7) also stated that the purpose of the 2001 surveys ''was to locate as many occurrences of the subject plants as possible, and to completely census and document reproductive and habitat data from every area in the dune system in which they were found,'' but noted that ''mappable concentrations of plants were noted * * * in less than 25% of the dunes proper'' (Phillips and Kennedy 2002, p. 17). Converse (*in litt.* 2006, p. 3) noted that some areas were not searched as intensively as others. In sum, it appears that all extant plants were probably not found within the large expanse of the dunes, that *A. magdalenae* var. *peirsonii* was unevenly distributed in the dunes, and that large concentrations of *A. magdalenae* var. *peirsonii* were noticeable within the areas closed to OHV use.

Survey efforts to date have clarified the uneven distribution of *A. magdalenae* var. *peirsonii* throughout the dunes. Even in the best of years, BLM observed *A. magdalenae* var. *peirsonii* in just 21 percent of the sample cells (USFWS 2006b, Table 1). In that year, 2005, half the observed *A. magdalenae* var. *peirsonii*, approximately 370,000 plants, occurred in 0.7 percent of the survey area (USFWS 2006b, Table 2) or about 145 acres (58 ha). Just over 11 percent of the survey area, or 54 percent of the occupied area, contained a trace density of plants (less than 39 plants/ac (100/ha)) (USFWS 2006b, p. 3). Further, the Service conducted a Chi-square analysis of BLM's 2005 data which revealed that the odds of finding *A. magdalenae* var. *peirsonii* in areas closed to OHV activity was 2.63 times greater than finding it in areas open to OHVs (USFWS 2006b, pp. 3–4). Phillips and Kennedy's 2005 (2005, Appendix A) and 2006 (2006, p. 8) reports further illustrate the fact that dense concentrations of plants produce large quantities of seed pods, which can, in turn, lead to high seed production estimates and high plant persistence in localized areas.

Astragalus magdalenae var. *peirsonii* exhibits high variability in density throughout the dunes, but density is highest in the southern half of the dunes (Willoughby 2005, Table 4; USFWS 2006b, Tables 1 and 2, Map 1). Phillips *et al.* (2001) established 19 of their 25 monitoring sites in close proximity to areas with high plant density (USFWS 2006b, Map 2). The difference between the current BLM studies and those of Phillips and Kennedy is one of detection rate. BLM systematically sampled the entire dunes and reported a detection rate of 0.21 (*A. magdalenae* var. *peirsonii* detected in 21 percent of the sample cells) in the best of years (USFWS 2006b, Table 1). Phillips and Kennedy systematically sampled areas selected for plant density yet can neither calculate nor report a rate of detection.

Phillips and Kennedy (2002, p. 10) observed that 70 to 75 percent of the dunes is not suitable habitat for *A. magdalenae* var. *peirsonii.* This observation closely corresponds to the 79 percent of unoccupied cells sampled by BLM and calculated by the Service (USFWS 2006b, Table 1) for 2005. As noted above, 11 percent of the area surveyed by BLM in 2005 contained a trace density of *A. magdalenae* var. *peirsonii,* suggesting that these areas are marginal habitat that supported plants due to the favorable conditions of 2005. Therefore, optimal habitat for *A. magdalenae* var. *peirsonii* may be substantially less than the 21 percent reported (USFWS 2006b). Considering that *A. magdalenae* var. *peirsonii* only occurs in the United States within the Algodones Dunes, and only within a small percentage of the dunes, it is a rare plant.

Astragalus magdalenae var. *peirsonii* is a relatively rare plant as further illustrated by comparison of its abundance and density to other psammophytic (dune loving) plants. The State endangered *Helianthus niveus* ssp. *tephrodes* (Algodones Dunes sunflower), a psammophytic plant with closely parallel distribution to *A. magdalenae* var. *peirsonii,* was more abundant than *A. magdalenae* var. *peirsonii* in nearly all years surveyed (Willoughby 2004, p. 36; Willoughby 2005a, Table 2–1). Pavlik (*in litt.* 2006) commented on plant densities for common desert *Astragalus* and herbs. As noted by Rundel and Gibson (1996, Table 5.11), density for three *Astragalus* taxa in the Mojave Desert ranged from 400 to 1,200 plants per acre (1,000 to 3,000 plants/ha). Pavlik (*in litt.* 2006, p. 2) stated that ''if any of the densities of established plants of common species * * * were multiplied by the size of their geographic ranges, the total populations would be on the order of 10^8 to 10^{10}.'' Bowers (1996) also found similar plant densities for psammophytic dune plants in the Sierra del Rosario Dunes of northern Sonora, Mexico, only 60 miles (100 km) away from the Algodones Dunes and with a similar climate. Density of four annual plant taxa ranged from 1,170 to 11,600 plants/ac (2,900 to 28,700 plants/ha) and for three perennial plants ranged from 5,000 to 6,200 plants/ac (12,500 to 15,400 plants/ha) (Bowers 1996, Table 2). *Astragalus magdalenae* var. *peirsonii,* with a density of 9 to 53 plants/ac (22 to 132 plants/ha), is 2 to 4 orders of magnitude lower than other common desert and dunes plants of the California desert. By even a qualitative comparison with data collected by other researchers, *A. magdalenae* var. *peirsonii* is quite rare relative to other species and in its spatial distribution in the dune landscape.

In summary, *Astragalus magdalenae* var. *peirsonii* is restricted to one area within the United States with a comparatively lower density than other dune species, with high variability in population size and density, climate, spatial distribution, and area occupied. The different population estimates presented in Table 1 above are valid in and of themselves but cannot be compared to one another due to differences in scale and methodology. Because of the differences between the total number of samples and the total area sampled, we recognize the recent BLM surveys as the most informative population estimates for *Astragalus magdalenae* var. *peirsonii.* The work of Phillips and Kennedy has been valuable in providing information on various parameters of *A. magdalenae* var. *peirsonii* life history, but cannot be used to support the assertions of the updated petition. Phillips and Kennedy's population estimates are appropriate only in the areas of their limited surveys, making it difficult to use their estimates to predict overall population health, trend, or stability. As the evidence suggests in Table 1, the size of the reproductive population of *A. magdalenae* var. *peirsonii* varies widely among all years surveyed and varies in density across the dunes (Willoughby 2005, Appendix 1; USFWS 2006b, Map 1). We expect these natural annual and spatial variations will continue and, therefore, detecting overall trends will be difficult for this species.

Seed Production and Seed Bank Dynamics

As described above in the Background section, many annual and short-lived perennial plants have a substantial soil seed bank. This life-history trait complicates assessment of viability for these species. When seed banks are important features of the demography of a species, census and demographic information for adult populations may mislead us about population viability. Understanding the seed bank would help us better assess the long-term viability of a species. However, seed banks are complex and difficult to quantify (Doak *et al.* 2002, pp. 312, 317; Given 1994, pp. 66–67).

Phillips and Kennedy (i.e., Phillips and Kennedy 2006, p. 10) and the updated petition (i.e., ASA 2005, p. 44) emphasize the importance of understanding the seed bank to understanding the status of *Astragalus magdalenae* var. *peirsonii.* However, the updated petition seems to confuse the number of seeds produced (i.e., fecundity) with the number of seeds in the seed bank. In fact, the updated petition appears to equate seed production with recovery (ASA 2005, pp. 4–6). For example, Phillips and Kennedy (2002, p. 28) estimated seed production on their 25 survey sites at approximately 2.5 million seeds. However, they erroneously refer to estimated seed production as the seed bank (Phillips and Kennedy 2002, p. 30; 2003, pp. 13, 21; 2004, p. 16; 2005, pp. 16–17). Lincoln *et al.* (1993, p. 223) define a soil seed bank as ''the store of dormant seed buried in soil'' whereas fecundity is defined as ''the potential reproductive capacity of an organism or population, measured by the number of gametes or asexual propagules'' (Lincoln *et al.* 1993, p. 93).

Phillips and Kennedy (2005, Table 6) emphasize that a high seed estimate is, in and of itself, enough to ensure stability. Pavlik (*in litt.* 2006, p. 3), in his peer review, commented that this is incorrect ''knowing what we know about the high rates of seed mortality observed in other rare plants.'' In her peer review, Bowers (*in litt.* 2006, p. 8) stated that ''multiplying average fecundity per plant by number of plants in a sample or population yields an estimate for sample or population fecundity. It is incorrect to substitute fecundity for seed-bank size.'' Phillips and Kennedy do not estimate the size of the persistent seed bank (Baskin and Baskin 2001, pp. 141–143) but rather attempt to assess the potential seed bank, and therefore population size, based on an estimated reproductive rate where seed pod production roughly equals reproductive stability.

In addition, Phillips and Kennedy (2002–2006) compound their sampling bias discussed above into hypothetical seed production values. Annual seed production was calculated from a few sample sites and extrapolated to 60 sites from the Phillips et al. (2001) reconnaissance (Phillips and Kennedy 2006, p. 5). The average number of 171 seed pods per plant, median of 113 per plant (Phillips and Kennedy 2002, p. 27), was determined from only 10 plants (Phillips and Kennedy 2003, p. 12; 2004, p. 16). Phillips and Kennedy (2006, p. 9) calculated seed pod production based on the assumption that 100 percent of perennial plants are reproductive. They estimated an average 14 seeds per pod using Barneby's (1964, p. 862) observation of 11 to 16 ovules per pod (Phillips and Kennedy 2002, p. 27). Phillips and Kennedy's population and seed production estimates are based on sample sites selected for *Astragalus magdalenae* var. *peirsonii* abundance (Phillips and Kennedy 2001, p. 10), thereby introducing a sample bias to the stated estimate of 2.5 to 5.7 million seeds.

In addition to this sample bias, the estimate is biased by the assumption that most plants were reproductive. Kalisz (*in litt.* 2006, p. 3) noted this problem in her peer review, stating that it was incorrect to multiply the number of pods by the total number of plants since many were seedlings. In fact, not all plants reproduce in a given year, even when the climate is favorable for reproduction. Phillips and Kennedy reported 45 percent of plants were reproductive in 2001 (Phillips and Kennedy 2003, Appendix A) and 63 percent were reproductive in 2005 (Phillips and Kennedy 2005, Appendix A). The BLM estimated that 75 percent of plants were reproductive in the 2005 surveys (Willoughby 2005, Table 4). In field surveys conducted in 2006, a year with no germination where the only *Astragalus magdalenae* var. *peirsonii* individuals alive in the Algodones Dunes were perennating plants, the BLM reported that 68 percent of plants were flowering adults (Willoughby 2006, p. vi). The Service reported 54 percent of plants as being reproductive in their study areas during 2006 (USFWS 2007, p. 13).

Furthermore, accurate estimates of seed production depend on accurate estimates of the number of seed pods produced and the number of seeds produced per pod. Median seed pod production, and therefore mean seed production, likely varies annually. Using a mean production value from only 10 plants at a single site will not yield an accurate estimate for a population. Phillips and Kennedy reported that first-year plants produce about five seed pods per plant and plants 1 year or more in age produce large quantities of seed pods (Phillips and Kennedy 2002, p. 27). Phillips and Kennedy (2005, p. 17) stressed that plants in their second year of growth and older produce many times more seed pods than first-year plants. Whether median seed pod production on older plants is 113 (Phillips and Kennedy 2002, p. 27) or 139 (USFWS 2007, p. 14), one of the limiting variables in *Astragalus magdalenae* var. *peirsonii* stability is the ability or capability of the plant to survive long enough to replenish the seed bank with enough seeds to ensure continuing cohorts of plants.

To estimate seed production per pod, in 2005 field surveys, the Service collected seed pods at random from plants throughout their survey area in April 2005. In this study, 416 seed pods from 78 plants were dissected and the undeveloped ovules were counted and separated from mature seeds. We observed an average of 5.2 mature seeds per pod. The total of mature seeds and undeveloped ovules (which are undeveloped seeds) averaged 11.4 per pod (McKinney *et al.* 2006, p. 85). One pod contained 15 mature seeds, while another pod contained 17 undeveloped ovules and mature seeds, closely matching the account of Barneby (1964, p. 862). The average of 5.2 mature seeds per pod is considerably less than the 14 seed per pod value used by Phillips and Kennedy in their seed production estimates (Phillips and Kennedy 2002, p. 27).

The BLM conducted a pilot seed bank study during spring 2007. This pilot study randomly sampled 735 of the total cells sampled during the spring 2005 surveys in the Gecko, Adaptive and Ogilby management areas. All *Astragalus magdalenae* var. *peirsonii* seeds on the sand surface within each cell were counted and then the cell was systematically sampled with 49 cores to a depth of 4 inches (10.16 cm), counting subsurface seed. BLM estimates a total of 53,200,000 seeds in the Gecko, AMA, and Ogilby management areas in 2007, corresponding to a density of 2,572 seeds/ac (6,356 seeds/ha) (Willoughby 2007, p. v, Table 5).

Finally, it is important to note that only a small fraction of seed produced in a given year survive to emerge as seedlings (Harper 1981, pp. 111–147; Fenner 1985, pp. 57–71). Dormant seeds that persist in the seed bank are subjected to many factors that may limit or preclude their ability to germinate. These factors include predation from animals or invertebrates, attack by microorganisms or fungi, habitat altered by wind, flood or mechanical events, or senescence (Baskin and Baskin 2001, pp. 149–160). After 5 years of greenhouse experiments, Porter *et al.* (2005, p. 29) reported high germination rates and little loss in seed viability. However, in artificial dune experiments the germination rate dropped to 27 percent and only another 2 percent of seeds germinated in the second season.

As noted above, Phillips and Kennedy (2005, p. 22) substantiated that plants in their first season could produce seed, although on a few seed-per-plant basis. The updated petition asserts that these first-year plants contribute significantly to the seed bank and that the seed bank is replenished within two or three growing seasons (ASA 2005, pp. 7–8). Phillips and Kennedy (2002, p. 27 and Table 7; 2003, pp. 20–21; 2004, p. 17) continually calculate the number of seeds produced per pod, per plant, and per site and equate that production with replacement of the seed bank. However, we know of no research or studies that provide information specifically on the replacement rate of *A. magdalenae* var. *peirsonii* to its seed bank or the seed bank baseline size. Phillips and Kennedy's field observations were all conducted in years with highly variable precipitation as compared to the previous two decades (see Willoughby 2006, Figure 3), and their studies cover a period with large variation in demographic rates. However, seed banks are governed by demographic rates that can be difficult to quantify over short study periods (Doak *et al.* 2002, p. 312). Willoughby (2007, p. 11) could not determine the seed bank age or associate it with the very productive year of 2005, so it is difficult to assign his estimate of 53,200,000 seeds as the seed bank baseline for the 2007 study areas. Also, no analysis of seed viability was conducted from the seeds sampled in spring 2007, further limiting the assessment of the seed bank size. Willoughby (2007, p. 11) suggests that seed bank sampling in a good rainfall year, after germination and before seed set, would address the question of seed bank depletion and seed bank age.

Kalisz and McPeek (1993, p. 319) emphasize that longer runs of bad precipitation years can magnify the negative effects on populations. Negative effects can include reduced germination, lower recruitment and reproduction, and runs of bad years exceeding the seed viability time in the seed bank. Because Phillips and Kennedy's (2002, p. 27 and Table 7; 2003, pp. 20–21; 2004, p. 17) estimates equate one seed produced with one plant germinated and we have no information on the seed bank baseline, their assertion that the seed bank is replaced within 2 or 3 growing seasons is speculative.

We agree with the updated petition (ASA 2005) that understanding the soil seed bank is important to understanding the long-term viability of *Astragalus magdalenae* var. *peirsonii*. However, for the reasons stated above, we do not agree that the work of Phillips and Kennedy (2002, 2003, 2004, and 2006) effectively elucidates the nature, extent, and dynamics of the seed bank for *A. magdalenae* var. *peirsonii* to the point that we fully understand the seed bank's contribution to the long-term persistence of *A. magdalenae* var. *peirsonii*. We also do not agree that these data provide evidence that *A. magdalenae* var. *peirsonii* will continue to persist because of the extent and nature of its seed bank. In fact, the information suggests that estimates of plant persistence and reproduction based on the anecdotal observations in the literature or single-year observations may not be accurate predictors of the nature or dynamics of the seed bank. Evidence suggests that not all plants (i.e., not 100 percent) reproduce in any given year, that seed pod production may be as much as one-third less than reported by Phillips and Kennedy, that seed production is as much as two-thirds less than that reported by Phillips and Kennedy, that only a small fraction of seeds may germinate from the persistent seed bank, and that under managed conditions about one-quarter of seeds in the wild may germinate. Phillips and Kennedy (2006, Table 3) did not consider any of these variables in their seed bank estimates. These variables and others (e.g., rate of seed mortality and aging, amount of seed lost to predators (Elzinga et al. 1998, p. 284)) must be considered for inclusion in models to estimate long-term persistence of *A. magdalenae* var. *peirsonii*. Pavlik (*in litt.* 2003, p. 4, comment for ASA (2001) petition) and Bowers (*in litt.* 2006, p. 9) noted that

Phillips and Kennedy have, however, begun to collect data valuable as initial parameters for these models.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. ''Species'' is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). Once the ''species'' is determined we then evaluate whether that species may be endangered or threatened because of one or more of the five factors described in section 4(a)(1) of the Act. We must consider these same five factors in delisting a species. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for one or more of the following reasons: (1) The species is extinct; (2) the species has recovered and is no longer endangered or threatened; or (3) the original scientific data used at the time the species was classified were in error.

A recovered species is one that no longer meets the Act's definition of threatened or endangered. Determining whether a species is recovered requires consideration of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as threatened or endangered, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting or downlisting and the removal or reduction of the Act's protections.

A species is ''endangered'' for purposes of the Act if it is in danger of extinction throughout all or a ''significant portion of its range'' and is ''threatened'' if it is likely to become endangered within the foreseeable future throughout all or a ''significant portion of its range.'' The word ''range'' in the significant portion of its range phrase refers to the range in which the species currently exists. For the purposes of this analysis, we will evaluate whether the currently listed species, *Astragalus magdalenae* var. *peirsonii,* should be considered threatened or endangered. Then we will consider whether there are any portions of *A. magdalenae* var. *peirsonii*'s range in which the status of the species differs from that determined for the species range-wide.

Merriam-Webster's Collegiate Dictionary defines ''foreseeable'' as ''being such as may be reasonably anticipated'' and ''lying within the range for which forecasts are possible'' (Merriam-Webster 2001, p. 456). For the purposes of this finding, the ''foreseeable future'' is the period of time over which events or effects reasonably can or should be anticipated, or trends reasonably extrapolated. Habitat for *Astragalus magdalenae* var. *peirsonii* in the United States is almost entirely in public ownership and management at the BLM Imperial Sand Dunes Recreation Area (ISDRA). Due to recent litigation, the specifics of how the BLM will manage the ISDRA in the short term are unclear. As described under ''A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range,'' the current Recreation Area Management Plan (RAMP) (BLM 2003a) is not being implemented due to a court order, but is the most recent plan available for analysis. At some point, BLM will implement a RAMP for the area, but when that will occur is also unclear. However, based on past management by BLM and the management direction for the ISDRA described in the current RAMP, we can reasonably anticipate that BLM will continue to manage habitat within the ISDRA in the long-term for multiple use, including OHV recreation. In light of such long-term management direction and the available data regarding impacts to *A. magdalenae* var. *peirsonii* resulting from anticipated continued and increased OHV use within the ISDRA, as analyzed below, we believe that reliable predictions can be made concerning the future as it relates to the status of *A. magdalenae* var. *peirsonii.*

In making this finding, we evaluated the best scientific and commercial data available (including the updated petition and associated documents (ASA 2005), our analysis (USFWS 2006a and 2006b) of BLM's raw data for the 2004 and 2005 surveys (Willoughby 2005a and 2005b, respectively), field studies conducted by the Service (Groom et al. 2007, USFWS 2007), the most recent reports by Phillips and Kennedy (2005 and 2006), BLM (Willoughby 2005b and 2006), and McGrann and McGrann (2005), and other information available to us) to determine whether delisting *Astragalus magdalenae* var. *peirsonii* is warranted. The following analysis examines the five factors described in section 4(a)(1) of the Act and those activities and conditions currently affecting, or that are likely to affect, *A. magdalenae* var. *peirsonii* within the foreseeable future.

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

In the final rule listing *Astragalus magdalenae* var. *peirsonii* (63 FR 53596, pp. 53605–53606) and in our 12-month finding on the previous petition to delist *A. magdalenae* var. *peirsonii* (69 FR 31523, pp. 31527–31529), we identified off-highway vehicle (OHV) use as a serious threat to *A. magdalenae* var. *peirsonii.* We continue to consider such activity, and the development associated with it, to present significant threats to *A. magdalenae* var. *peirsonii* and its dune habitat. The studies supporting this conclusion and the extent with which *A. magdalenae* var. *peirsonii* is threatened by OHVs are discussed below, as are probable effects of OHVs on seedling establishment, and visitation patterns in the Algodones Dunes.

Studies on desert plants other than Astragalus magdalenae var. peirsonii. Although few quantitative data are available, early studies documented general OHV impacts on desert and psammophytic vegetation in California. Bury *et al.* (1977, pp. 16–19, Fig. 11) compared eight paired sites in the Mojave Desert in 1974 and 1975, examining the impact of OHV use on creosote bush scrub and associated wildlife. Pavlik (1979, p. 75–79) quantified the immediate physical effects of direct contact with an OHV on the Eureka Dunes in Inyo County, California. Luckenbach and Bury (1983, p. 280) in non-replicated studies of paired plots along State Route 78 through the Algodones Dunes, reported reduced numbers of herbaceous and perennial plants, arthropods, lizards, and mammals between areas closed to entry (i.e., control plots) and those exposed to heavy OHV use. The results of these studies indicated that OHV impacts were higher or had a greater effect on habitat outside control plots. However, all of these studies were limited in scope because they either observed impacts on a small number of sample plants or the sample areas were limited in distribution.

Studies with information on OHV damage to Astragalus magdalenae var. peirsonii. Several studies included data and/or observations relevant to assessing OHV damage to *A. magdalenae* var. *peirsonii.* McGrann and McGrann (2005) assessed OHV impacts in paired plots along OHV closure boundaries. Phillips and his colleagues' reports (2001, 2003, and

2005) include estimations of numbers of plants damaged, likelihood of OHVs avoiding plants, and resilience of plants to OHV impacts. Willoughby (2005a, 2005b) included estimates of the numbers of plants damaged in 2004 and 2005. Groom et al. (2007) followed the fates of individual plants (some run over by OHVs and others not (i.e., ''controls'')) throughout the growing season. Finally, a study conducted by Service biologists as a follow-up to Groom et al. (2007) compared survival of *A. magdalenae* var. *peirsonii* over the growing season in areas open to OHVs with survival in areas closed to OHVs. Each of these studies is discussed briefly below.

McGrann and McGrann (2005, pp. 67–69), used 42 matching pairs of plots systematically distributed along closure boundaries in three study areas of the Algodones Dunes to assess OHV impacts on *Astragalus magdalenae* var. *peirsonii*. However, the results of this study were inconclusive due to the low number of plants sampled, sampling period, and climate. Only 19 plants were found among the 42 plots, and the Buttercup study area was sampled very late in the season. *Astragalus magdalenae* var. *peirsonii* densities were higher for small plants and seedlings on control plots versus impact plots with more than 30 OHV tracks per plot when all plots were pooled, but were not significant for adult plants (McGrann and McGrann 2005, pp. 71–72). In plots with fewer than 30 OHV tracks, 50 percent had higher overall plant density than in the control plot.

Because of the transient nature of the surface structure of dunes, most quantitative measures of OHV impacts are given in terms of numbers of plants impacted. Phillips *et al.* (2001, p. 12) stated that only 667 plants observed in the areas open to OHVs showed signs of contact with OHVs. Phillips and Kennedy (2003, p. 21) noted only 430 plants damaged by OHVs during 2003. However, we find these values to be of limited use for several reasons. First, both of these surveys occurred from March to May 2001 and 2003, respectively, well after the peak holidays with high dune visitation. Second, Phillips and Kennedy's damage reports based on their monitoring sites represent only about 138 ac (56 ha). If we extrapolate their data to *Astragalus magdalenae* var. *peirsonii* habitat in the area open to OHV activity, approximately 4,709 ac (1,905 ha), the number of plants potentially impacted by OHVs could be more than 10,000 plants, but we have no way of evaluating the accuracy of this extrapolation. Third, Phillips *et al.* (2001, p. 12) noted that signs of OHV effects are transitory, observing that ''as wind obliterated the tracks there was no sign of any effect.'' Phillips and Kennedy may be under estimating damage by assuming that the only direct evidence of any ''effect'' is a tire track in the sand that can be directly associated with a damaged plant. We assume that the wind will also obliterate any evidence of damage to plants by blowing away broken branches and burying broken stems in sand. Fourth, Phillips *et al.* (2001) did not record whether these were one-time observations over the survey days, or if damaged plants were tracked to prevent double-counting of individuals.

In addition, Phillips *et al.* (2001, p. 12) suggested that the number of damaged plants was minimal because OHV drivers avoid vegetated basins, where *Astragalus magdalenae* var. *peirsonii* often grows in proximity to shrubs, to prevent potential tire damage. The authors provided no information on plants observed outside of bowls with woody detritus, nor did they discuss the potential damage to plants from four-wheel quads or motorcycles that can traverse woody basins without damaging equipment. However, Phillips and Kennedy (2005, p. 22) also observed that *A. magdalenae var. peirsonii* was more widely distributed in 2005 compared with other years, ''with low density occurrences often observed between sites where no plants'' were before. This suggests that plants, at least in 2005, were not isolated to bowls with woody vegetation and therefore were unprotected.

Phillips *et al.* (2001, p. 12) anecdotally observed that nearly all plants that were run over were resilient and ''popped back up'' with no damage to the stems or flowers and that ''as soon as the wind obliterated the tracks, there was no sign of any effect.'' These observations of impact and resilience were made without determining the persistence or the productivity of the plants damaged. Additionally, no follow-up visits were noted, and no measures of impact to the habitat, description of type of damage, or effects on plant reproductive capacity were provided.

Willoughby (2005a, pp. 13–14) reported that 731 plants exhibited signs of OHV impact during the 2004 surveys, and more recently he reported that 8,113 plants exhibited signs of OHV impact along the 2005 survey transects (Willoughby 2005b, p. 24). Both of these estimates, 731 and 8,113 plants, are from one-time observations along transect surveys conducted during spring 2004 and 2005, respectively. In light of the number of survey transects in spring 2005, we consider Willoughby's (2005b, p. 24) estimate of 8,113 plants damaged by OHVs as the best single-date, dunes-wide estimate available. Nonetheless, this number was acquired from surveys conducted from mid-February through April 2005, well after peak-use holiday weekends. All survey cells were visited once during this time period. The estimate, 8,113 plants, does not include plants likely impacted during the peak holiday weekends prior to the surveys. We estimate that the number of plants impacted could be 2 to 3 times larger when these holidays are factored in, based on the number of peak-use days prior to the surveys, but we have no means to evaluate the accuracy of this estimate.

Groom *et al.* (2007) is the first study to date to monitor individual plant fates through a growing season. *Astragalus magdalenae* var. *peirsonii* GPS (Global Positioning System) coordinates were acquired on randomly selected plants marked in an experiment conducted from February until June 2005. Some plants (i.e., ''treatment plants'') in an area closed to OHV activity were purposefully struck with an OHV and their reproductive capacity and fate were tracked with repeated monthly visits. Results indicate that plants with canopies less than 18 inches (0.5 m) had a 33 percent lower survival rate than plants in the control group that were not struck (Groom *et al.* 2007, pp. 128–130). Service biologists continued to track survivorship in a follow-up study conducted from December 2005 until June 2006. No germination occurred during the 2006 growing season, indicating that all live plants encountered were greater than 1-year old. In this study, GPS coordinates were acquired for *A. magdalenae* var. *peirsonii* plants in two 618-ac (250-ha) study areas, one in an OHV-open area and one in an OHV-closed area. Every plant was revisited monthly to monitor health, reproductive state, biometrics, and seed pod production. Plants in the OHV-open area were 20 percent less likely to survive the entire study period than plants in the OHV-closed area (USFWS 2007, p. 14).

While the observational data reported by Phillips and Kennedy and BLM shed some light on OHV impacts to *Astragalus magdalenae* var. *peirsonii*, the results are of limited value. Groom *et al.* (2007) and the follow-up Service study have three principal advantages over the observational data. First, these studies were designed to test specific hypotheses regarding plant survival, using dune bowls or individual plants that were randomly selected within each study area. Second, in both years, these studies documented plant fates through the season, rather than a single observation late in the season. Third, the 2006 study (USFWS 2007) covered all major holiday weekends except Thanksgiving, extending the time period of the study to correspond with OHV use in the dunes. The data including major holiday periods more accurately reflects plant fate because the risk to plants in the open area is dependent upon dune use patterns.

Most of the studies, and in particular Groom *et al.* (2007) and the follow-up Service study (USFWS 2007), indicate that *Astragalus magdalenae* var. *peirsonii* plants can be damaged by OHV activity. In fact, the observation by Phillips *et al.* (2001, p. 12) that ''the occurrence of dune plants and heavy use areas for vehicles is, to a large extent, mutually exclusive,'' describes similar findings by Willoughby (2000, p. 36), WESTEC (1977, pp. 131–134), Luckenbach and Bury (1983, p. 280), ECOS (1990, p. 81), and McGrann and McGrann (2005, pp. 69–76). While little or no documentation exists of the graded effects of medium- and low-use areas for vehicles, by the time the vehicle use level can be described as ''heavy,'' the area is generally devoid of plants. The exact process is not understood, but we postulate that either repeated depletion of pre-flowering seedlings depletes the seed bank, elimination of standing seed-producing plants diminishes and eventually extinguishes input to the seed bank, or untimely or excessive scarification of the seeds by the additional grinding actions of sand moved by OHVs causes seeds to desiccate. The conclusion that the petitioners reach suggesting OHVs are not damaging the *A. magdalenae* var. *peirsonii* population originated in Phillips *et al.* (2001) (see discussion in Distribution of *Astragalus magdalenae* var. *peirsonii* in the Algodones Dunes section). This conclusion is based on a reconnaissance of the dunes that assessed presence and abundance of *A. magdalenae* var. *peirsonii* in a general way in open and closed areas. It was not designed to determine whether OHVs damage *A. magdalenae* var. *peirsonii*, and it is internally inconsistent on whether differences in presence and abundance were observed in open and closed areas. If presence and abundance of *A. magdalenae* var. *peirsonii* were similar in open and closed areas, it would suggest that OHVs may not be affecting abundance. However, the Service's analysis of BLM's 2005 data indicates that the petitioner's assertion is incorrect (USFWS 2006b, pp. 3–4). Finally, Willoughby (2007, p. 9) concludes that ''the closed areas of the Gecko and Ogilby MAs have larger seed banks than the open areas.''

Seedling establishment. In addition, the coincidence of timing of seedling establishment and the cooler months preferred by OHV enthusiasts increases the susceptibility of *Astragalus magdalenae* var. *peirsonii* to impacts from OHVs (Romspert and Burk 1979, pp. 29–30). The period of plant sensitivity, approximately late October to late February, includes seed germination and emergence (Barneby 1964, p. 862; Phillips and Kennedy 2002, p. 29). Aside from the direct crushing of the delicate seedlings, OHVs in close proximity to the seedlings may indirectly affect germinating seedlings by accelerating soil desiccation that can result in root desiccation (Harper 1981, pp. 116–117; Lathrop and Rowlands 1983, p. 144). The roots of *A. magdalenae* var. *peirsonii* seedlings are especially sensitive to drying out if the plants or sand surface are disturbed. Seedling death may result from both types of impacts. Seedlings damaged but not killed may produce fewer flowers and seeds than undamaged seedlings leading to a gradual diminishment of the seed bank (Pavlik 1979, p. 76). This period of sensitivity directly overlaps five of the six visitation peaks to the Algodones Dunes, including Halloween, Thanksgiving, New Years Day, Martin Luther King Day, and Presidents' Day (BLM 2003a, pp. 89, 201). When Easter weekend is included, all holiday weekends, about 27 days, account for 50 percent of annual visitation to the Dunes, with the remaining 50 percent occurring on non-holiday weekends between October and May (BLM 2003a, pp. 89, 201).

Visitation patterns. Since we listed *Astragalus magdalenae* var. *peirsonii*, visitation by recreational users to the ISDRA has continued to increase (BLM 2003b, p. 25; BLM 2006a) and has outpaced previous projections (BLM 1987, Table 6). The updated petition (ASA 2005) did not address visitor use patterns or increases relative to the distribution of *A. magdalenae* var. *peirsonii*. The total number of visitors to the dunes in 2006 (BLM 2006a) has nearly quadrupled from 1995 (BLM 2003b, p. 25). Based on figures from BLM, visitor use increased by 69 percent from fiscal year 2000 (BLM 2003a, p. 237) to fiscal year 2006 (BLM 2006a). Specifically, BLM recorded 867,753 visitor use days in 2000 (BLM 2003a, p. 237) and 1,464,580 in 2006 (BLM 2006a). Visitor use was up an additional 5 percent in fiscal year 2006 over fiscal year 2005 (BLM 2006a) despite a court-ordered closure of 29 percent of the ISDRA and claims that high gas prices would reduce visitation, and was up slightly in fiscal year 2007 over fiscal year 2006 (BLM 2007). Visitor use is now more than 3 percent over the projected estimate for 2012/2013 (BLM 1987, p. 15; 2003a, p. 237; 2006a). User groups are advocating for building as many camping pads as possible until ''over a span of time 100 percent of both sides of [Gecko] road would be camping pads'' in the Gecko Management Area (ASA 2002, p. 4). We conclude that visitor use in the Algodones Dunes is likely to continue to increase.

The BLM has attempted to assess OHV impact areas on the dunes in 2 separate analyses. A vehicle track map (Willoughby 2000, Map 24) along selected transects of the Algodones Dunes on Easter weekend 1998 showed that considerable areas of potential habitat have been impacted. In a more recent study, a randomized sample of 775 survey cells occupied by *Astragalus magdalenae* var. *peirsonii* in 2005 were selected and analyzed from digital aerial photographs acquired on Presidents' Day weekend in 2006 (Willoughby 2006, p. 3). The results indicate a slight negative relationship between the logarithm (a common statistical transformation of data) total number of *A. magdalenae* var. *peirsonii* plants and the density of OHV tracks, but this relationship was not statistically significant ($P = 0.069$) (Willoughby 2006, p. 10, Figure 12). The results of both of these analyses were inconclusive because on-the-ground counts of plants coincident with the vehicle-track mapped areas were not performed and cumulative impacts to standing plants, seed banks, or habitat cannot be estimated; whereas the studies of Groom *et al.* (2007) and USFWS (2007) carefully monitored the fates of individual plants damaged by OHVs or in high OHV-use areas.

Though a court order continues to require that BLM maintain 49,300 ac (19,950 ha) of temporary vehicle closures within five selected areas in the ISDRA, BLM's 2003 Recreation Area Management Plan (RAMP) (2003a, pp. 37–78) proposed opening to OHV use (to various extents) all temporary closures in the dunes. Although this plan is not currently being implemented, it is the most recent plan available for analysis. Under this plan, the 27,700-ac (11,200-ha) North Algodones Dunes Wilderness (Wilderness) would continue to be closed to OHV use. However, less than 9 percent of the U.S. population of

Astragalus magdalenae var. *peirsonii* occurs within the Wilderness. Although some areas supporting *A. magdalenae* var. *peirsonii* are remote, technological advances, such as a fully implemented GPS navigation system (USDoD 2005, p. 2–2), affordable GPS units and cell phones, and OHVs with greater range, have removed the obstacles to OHV users to penetrate further into the dunes (ASA 2006). Thus, well-equipped vehicles can now travel farther on a tank of gas and are less likely to get lost in the featureless expanse of the dunes, expanding potential OHV impacts into areas that once inhibited access. If the court order is lifted and the temporary closures are reopened to OHV activity, adverse effects to *A. magdalenae* var. *peirsonii* populations within the U.S. will increase.

If the court order were to be lifted, and BLM's 2003 RAMP implemented, all areas in the Algodones Dunes with *Astragalus magdalenae* var. *peirsonii*, except the Wilderness area, would be open to some level of OHV use. Sixty-six percent of the U.S. population of *A. magdalenae* var. *peirsonii* is located in the temporary closures (USFWS 2006b, Table 2), 9 percent is in the Wilderness area, and the remaining 25 percent in areas open to OHV use. Currently, the odds of finding *A. magdalenae* var. *peirsonii* in areas closed to OHVs are 2.6 times greater than in areas open to OHV use (USFWS 2006b, pp. 3–4). Evidence indicates that 20 percent of the population occurring in areas open to OHV use will not survive the entire growing season (USFWS 2007, p. 14) and that the chances of an average plant surviving an impact will be reduced by 33 percent (Groom et al. 2007, pp. 128–130). If the temporary closures were removed and visitor use was equivalent to that now documented in current open areas throughout the dunes, it is reasonable to expect that plant density of *A. magdalenae* var. *peirsonii* would be reduced to the mean density level now recorded for the open areas, 23 plants/ac (56/ha) (USFWS 2006a, p. 4). We estimate that, at that density, the dunes-wide population would be reduced by approximately 41 percent (Bartel *in litt.* 2007, p. 2). This predicted reduction in the 2005 observed population for *A. magdalenae* var. *peirsonii* in the ISDRA may overestimate the effects of OHVs because we did not account for the minimization of impacts via BLM's implementation of the adaptive management proposed for the Adaptive Management Area (AMA) of the ISDRA, nor did we account for the distance from camping areas or access points that likely would ameliorate or attenuate the effects of OHV use. Conversely, the 41 percent figure may underestimate the effects of OHVs because we did not account for the increasing trend in OHV use in the Algodones Dunes. The AMA and Ogilby temporary closures total 37,519 ac (15,184 ha) and contain more than 50 percent of the current *A. magdalenae* var. *peirsonii* population (USFWS 2006b, Table 2). Even in light of the potential problems with this estimate, the best data indicates that reopening the temporary closure areas in the dunes to OHV use may reduce the *A. magdalenae* var. *peirsonii* population in these two management areas alone by 50 percent. In addition, the areas of highest abundance are areas closest to, and within easy access of, the sand highway (the main unpaved thoroughfare between staging areas and large, recreational dunes or dune complexes) (USFWS 2006b, Map 1).

We are confident that reopening the temporary closure areas in the dunes to OHV use would increase the impact of OHVs on *Astragalus magdalenae* var. *peirsonii*. However, we acknowledge that there is uncertainty with respect to the future management of the area by the BLM. BLM and the Service are currently working together to consider options for future management of the Algodones Dunes and the potential impacts of various scenarios on *A. magdalenae* var. *peirsonii*. It is conceivable that future management decisions could provide protection and management that would ameliorate threats to *A. magdalenae* var. *peirsonii* to such an extent that we would consider proposing to delist the species.

In summary, areas within the dunes subject to intensive OHV use have a lower abundance of *Astragalus magdalenae* var. *peirsonii* while plants within the interior portions of the dunes and within temporary closure areas appear to have been less affected by OHV use. The updated petition and associated documents report hundreds of plants detected during relatively brief survey periods that were impacted by OHVs (ASA 2005). Repeat visits to marked plants attest to a lower survival rate for plants struck by OHVs (Groom *et al.* 2007, pp. 128–130) and for plants in open areas in general (USFWS 2007, p. 14). Thus, studies of the effects of OHVs on *A. magdalenae* var. *peirsonii* (e.g., Groom *et al.* 2007), the reported absence of dune plants from areas of heavy OHV use, the documented trends of increasing visitorship in the Algodones Dunes, the potential for the lifting of the temporary closures, and the uncertainty associated with future management of the ISDRA support the conclusion that OHV use continues to pose a significant threat to *A. magdalenae* var. *peirsonii* and its dune habitat in the foreseeable future, and we can reliably predict that the impacts of continued and increasing levels of OHV use anticipated to occur, particularly if *A. magdalenae* var. *peirsonii* is no longer listed, would likely result in a downward trend in the population until *A. magdalenae* var. *peirsonii* is in danger of extinction.

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

We do not have any data suggesting that *Astragalus magdalenae* var. *peirsonii* is, or may be, overutilized for commercial, recreational, scientific, or educational purposes.

C. Disease or Predation

Herbivory was reported for some *Astragalus* taxa in the final rule listing *A. magdalenae* var. *peirsonii*. As part of a series of reports on the natural history of *A. magdalenae* var. *peirsonii*, Porter (2003a, p. 4) noted the general poor health of adult plants and attributed it to rodent and insect herbivory. Porter (2002a, p. 07862) reported ''nearly ubiquitous'' harvesting of leaflets and young inflorescences by rodents in *A. magdalenae* var. *peirsonii* populations. Most of the plants had leaves, leaflets, or terminal portions of the stems removed, likely by unidentified rodents that had left abundant tracks around *A. magdalenae* var. *peirsonii* plants. Porter (2003a, p. 4) also had similar results in 2003. To the extent that rodents remove photosynthetic tissue and young inflorescences, plants are likely to exhibit a loss of vigor and reduction in reproductive output (i.e., seeds) as noted by Hulme (1994, pp. 647–650). Indeed, Phillips and Kennedy (2002, p. 24) noted that seed bank counts were lower in areas where they noted kangaroo rat tracks and dens and suggested that this should be investigated. *Astragalus magdalenae* var. *peirsonii*, with its large seeds, may be more prone to seed predation than the observations reported by BLM or Phillips and Kennedy (Hoffmann *et al.* 1995, pp. 203–205). Pavlik (*in litt.* 2003, p. 5, comment for ASA (2001) petition) noted that rodents may be a constant, long-term source of high seed mortality that could dramatically reduce the seed bank.

Beetles, in the family Bruchidae, were reported to contribute to the high mortality of seeds and reduced seed crop for *Astragalus magdalenae* var. *peirsonii* by Romspert and Burk (1979, pp. 28–29). Larvae of these beetles eat the contents of the seeds before emerging as adults. Fruits collected in April continued to release beetles into October (Romspert and Burk 1979, p. 29). Porter (2003a, p. 5) found between 45 and 86 percent of the fruits on the few *A. magdalenae* var. *peirsonii* plants where he could find fruits were infested with bruchid beetles. The range of infested fruits was 0 to 29 percent for dispersed fruits on the ground. Similarly, for another obligate dune plant, *Astragalus lentiginosus* var. *micans*, Pavlik and Barbour (1985, p. 61) found that dispersed fruits had about 66 percent of the seeds eaten or damaged by insect larvae compared to 86 percent of the seeds in fruits still on the plant. Also the number of undamaged seeds decreased by more than 60 percent between April and May, indicating that predation is highest at dispersal time. The reduction of productivity of any given cohort of *A. magdalenae* var. *peirsonii* from seed predation is unknown but may locally be considerable in a given year. Seed predation has also been reported to cause significant loss of ovules or seeds in *Sidalcea nelsoniana*, a federally threatened perennial forb (Gisler and Mienke 1997, pp. 58–60), in *Astragalus canadensis* (Boe *et al.* 1989, pp. 514–515), and in two other species of *Astragalus* (Green and Palmbald 1975, pp. 1436–1437). As yet unidentified weevils were also observed to strip the epidermis from the stems, which would affect the movement of food and water in the plants (Porter 2003a, p. 4).

Available information suggests that rodent herbivory and seed predation by insects, as noted above, may play a pivotal role in plant viability in dune bowls (Hulme 1996, pp. 610–611). We do not believe that natural herbivory, by itself, is likely to pose a direct threat to the conservation of *Astragalus magdalenae* var. *peirsonii*. However, although the total impact to annual recruitment has not been quantified in the dunes, the additional loss or damage of seeds or seedlings through natural herbivory could exacerbate or augment threats to *A. magdalenae* var. *peirsonii* in the presence of other stressors such as increasing OHV activity, especially when the damage from natural herbivory potentially impacts 30 to 60 percent, or more, of the standing population (Porter 2003a, pp. 4–5).

D. The Inadequacy of Existing Regulatory Mechanisms

The discussion of the lack of regulatory protections for *Astragalus magdalenae* var. *peirsonii* by the State of California cited in the final listing rule (63 FR 53596) is still accurate. Pursuant to the Native Plant Protection Act (California Department of Fish and Game (CDFG) Code) and the State Endangered Species Act (CESA), *A. magdalenae* var. *peirsonii* was listed as endangered in 1979. Because this plant primarily occurs on BLM-managed lands, provisions of CESA do not apply. The BLM and CDFG developed a habitat management plan (HMP) in 1987 that included provisions for monitoring transects every other year until trends were established. However, little monitoring specific to sensitive species was carried out by BLM prior to the listing of *A. magdalenae* var. *peirsonii*. Since the listing, BLM and CDFG have been conducting periodic monitoring for the rare plants on the Algodones Dunes.

The updated petition indicates that *Astragalus magdalenae* var. *peirsonii* has received ''adequate regulatory protection from BLM since 1977'' (ASA 2005, p. 49). This statement is based on the premise that BLM can only manage human activities, and human activities do not negatively impact *A. magdalenae* var. *peirsonii*. As indicated above in Factor A, we disagree with this assertion because we conclude that OHV use (i.e., human activity) is a significant threat to *A. magdalenae* var. *peirsonii*. Given our conclusion that OHV activity is a threat to *A. magdalenae* var. *peirsonii*, we note that BLM's management of OHV activity can affect the magnitude of the threat from OHVs to the plant. No assessment exists of the relative contribution of the portion of the population present in the Wilderness (permanently closed) to the persistence of *A. magdalenae* var. *peirsonii*. Less than 9 percent of *A. magdalenae* var. *peirsonii* plants were observed in the Wilderness in 2005, and though the Wilderness is considered closed to OHV use, indications of occasional illegal entry in the form of OHV tracks in the area can be found on maps (Willoughby 2000, Map 24). Designation of the Wilderness was one of the reasons cited in the final rule for changing the proposed status from endangered to threatened (63 FR 53609). As stated in the final listing rule (63 FR 53609), ''While this taxon remains vulnerable to the OHV use occurring over most of its dune habitat, the Service believes that the dispersed nature of its colonies and the wilderness designation reduce the potential for immediate extinction.''

BLM temporarily closed areas of the Algodones Dunes to off-highway and other vehicular traffic effective November 3, 2000. Notwithstanding the 2005 Record of Decision, 2003 RAMP, and Final Environmental Impact Statement for the ISDRA where BLM (2003a) proposed to reopen those temporary closures to OHV activity, the U.S. District Court for the Northern District of California ordered, among other things, that BLM ''maintain the vehicle closures as identified in the 'Temporary Closure of Approximately 49,300 Acres to Motorized Vehicle Use of Five Selected Areas in the ISDRA'.'' If the court order is lifted and these areas are reopened, the threat to *A. magdalenae* var. *peirsonii* would increase above current levels. Such action would open 29 percent of the ISDRA to OHV use, leaving the 27,700-ac (11,200-ha) Wilderness as the only closed area. Removing the closures and/or increasing the number of camping pads in the Gecko and Ogilby Management Areas is likely to reduce *A. magdalenae* var. *peirsonii* in those management areas significantly (Bartel *in litt.* 2007, p. 2). However, we expect that the species will continue to persist in fewer numbers in Gecko and Ogilby, even if OHV use increases.

In addition, as noted above in Factor A, there is considerable uncertainty with respect to future management of the Algodones Dunes. In light of the uncertain status of the 2003 RAMP, we believe that adequate regulatory mechanisms are not yet in place to support removing the protections of the Act.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Trespass. Although the range-wide impact is difficult to assess, we have received an increase in reports of purposeful or unintentional trespass into *Astragalus magdalenae* var. *peirsonii* habitat that is closed to OHV use. Porter (2002b, pp. 2–3) described tracks and incursions of OHVs into areas closed to OHV traffic and an instance where all of the aerial stems of a plant had been cut off. These closed areas are outside of the Wilderness. Activity of this nature has been noted on maps and by ground personnel (Willoughby 2000, Map 24; Porter 2002b, p. 2).

Low reproduction. *Astragalus magdalenae* var. *peirsonii* may also be threatened by low numbers of reproducing individuals, a circumstance that occurs from time to time. As noted earlier, not all plants flower each year. Movements and fluctuations of populations have not been recorded for a long enough period to assess the significance of low reproduction to the survival of the taxon. The BLM (Willoughby 2001, p. 22) reported a total of only 86 plants throughout their transect areas in the 2000 survey. Phillips *et al.* (2001, p. 10) found only 5 plants more than a year old out of the

72,000 counted in their survey covering approximately 35,000 ac (14,000 ha) open to OHV use in 2001. Having so few older individuals may be a concern given that the older, larger plants contribute more to the seed bank than younger, flowering juveniles (Romspert and Burk 1979, p. 28; Phillips and Kennedy 2002, p. 27). Random events, like periodic drought, may have a significant detrimental effect on the species when so few individuals are present or when the habitat requirements are so narrow that random environmental conditions can result in the demise of an entire cohort. In 2003, the entire cohort of seedlings was lost due to delayed germination and high temperatures (Phillips and Kennedy 2003, p. 15; Porter 2003b, p. 1). The ecological impact of any cyclic depletion and restoration of the seed bank is unknown.

Fragmentation and isolation. As discussed above, less than 9 percent of *A. magdalenae* var. *peirsonii* plants were observed in the Wilderness in 2005. Implementation of the 2003 RAMP, as currently written, would fragment the entire range of the *A. magdalenae* var. *peirsonii* population into management islands of plants separated by large OHV-impact areas (see Willoughby 2006, Map 6). Effects to *A. magdalenae* var. *peirsonii* from fragmentation would be difficult to measure but may include lower seed production due to reduced visitation by pollinators (Jennersten 1988, pp. 361–363; Steffan-Dewenter and Tscharntke 1999, pp. 434–436; Baron and Bros 2005, pp. 48–50) and increased local predation pressure in instances where populations are reduced to isolated individuals (Girdler and Radtke 2006, pp. 220–222). If the Wilderness were isolated and the total population diminished as estimated, in light of proposed management actions, justification to delist *A. magdalenae* var. *peirsonii* would be difficult. *Astragalus magdalenae* var. *peirsonii* has evidently persisted at low abundance in areas of moderate to high OHV use over the short term. However, because protection is ensured for only 9 percent of the population, *Astragalus magdalenae* var. *peirsonii* is at increased risk of long-term population decreases due to events such as long-term drought, climate change, or focused predation.

Significant Portion of the Range Analysis

On March 16, 2007, a formal opinion was issued by the Solicitor of the Department of the Interior, ''The Meaning of 'In Danger of Extinction Throughout All or a Significant Portion of Its Range' '' (U.S. DOI 2007). We have summarized our interpretation of that opinion and the underlying statutory language below. A portion of a species' range is significant if it is part of the current range of the species and it contributes substantially to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species. In other words, in considering significance, the Service should ask whether the loss of this portion likely would eventually move the species toward extinction, but not necessarily to the point where the species should be listed as threatened.

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

If we identify any portions that warrant further consideration, we then determine whether in fact the species is threatened or endangered in any significant portion of its range. Depending on the biology of the species, its range, and the threats it faces, it may be more efficient for the Service to address the significance question first, or the status question first. Thus, if the Service determines that a portion of the range is not significant, the Service need not determine whether the species is threatened or endangered there; if the Service determines that the species is not threatened or endangered in a portion of its range, the Service need not determine if that portion is significant.

Finding

As required by the Act, we considered the five potential threat factors to assess whether *Astragalus magdalenae* var. *peirsonii* is threatened or endangered throughout all or a significant portion of its range. When considering the listing status of the species, the first step in the analysis is to determine whether the species is threatened or endangered throughout all of its range. The status review for *A. magdalenae* var. *peirsonii* contained in this document is for the entire range of this species as listed under the Act.

We have carefully assessed the best scientific and commercial information regarding the biology of this species and its threats. We reviewed the updated petition and associated documents, information available in our files, and other published and unpublished information submitted to us during the public comment period following our 90-day petition finding. We also reviewed new data and information on the life history and ecology of *Astragalus magdalenae* var. *peirsonii*.

For many years controversy has focused on the abundance of *Astragalus magdalenae* var. *peirsonii* in any given year and the implications of abundance figures for the long-term persistence of the species. For a species that fluctuates widely in numbers from year to year, an assessment of abundance may not be the most meaningful measure of the likelihood of persistence. Characterizing the population trend, resilience, and long-term viability of *A. magdalenae* var. *peirsonii* would be more relevant but has not been done in a rigorous and meaningful manner to date. In addition, we agree with the updated petition (ASA 2005) that understanding the soil seed bank is important to understanding the long-term viability of *A. magdalenae* var. *peirsonii*. However, we do not agree that the nature, extent, and dynamics of the seed bank for *A. magdalenae* var. *peirsonii* have been characterized to the point that we fully understand the seed bank's contribution to the long-term persistence of *A. magdalenae* var. *peirsonii*. In addition, we do not agree that the available data provide evidence that *A. magdalenae* var. *peirsonii* will continue to persist because of the extent and nature of its seed bank. In short, we have an incomplete understanding of the relationship of abundance data and seed bank data to the long-term persistence of *A. magdalenae* var. *peirsonii*. Therefore, we cannot conclude that high numbers of above-ground plants and the purported large numbers of seeds in the seed bank ensure the long-term persistence of the species.

We continue to consider OHV activity the primary threat to *Astragalus magdalenae* var. *peirsonii*. Documentation available attests to historical and ongoing OHV impacts to the species (WESTEC 1977, pp. 1–135; ECOS 1990, pp. 1–85; Willoughby 2000, pp. 1–37, 2001, pp. 1–31, 2004, pp. 1–20, 2005, pp. 1–; Phillips *et al.* 2001, pp. 1–13; Phillips and Kennedy 2003, pp. 1–21; Groom *et al.* 2007, pp. 119–134; USFWS 2006b, pp. 1–9, and 2007, pp. 1–36). Areas within the dunes subject to intensive OHV use (e.g., staging areas) have a lower abundance of *A. magdalenae* var. *peirsonii*. Longer-term monitoring indicates that plants exposed to OHV activity have a reduced likelihood of survival (e.g., Groom *et al.* 2007, pp. 128–130). Available information suggests that within the foreseeable future OHV use will continue to increase and pose a threat to the survival of *A. magdalenae* var. *peirsonii*, and we can reliably predict that the impacts of continued and increasing levels of OHV use anticipated to occur, particularly if *A. magdalenae* var. *peirsonii* is no longer listed, would likely result in a downward trend in the population until *A. magdalenae* var. *peirsonii* is in danger of extinction. Secondary threats to *A. magdalenae* var. *peirsonii* include rodent and insect herbivory, seed predation, and effects of fragmentation and environmental stochasticity/catastrophes, all which may be exacerbated by the low reproduction of *A. magdalenae* var. *peirsonii*.

While the North Algodones Dunes Wilderness will continue to be closed to OHV use, this area alone is not sufficient to ensure the long-term survival of *Astragalus magdalenae* var. *peirsonii* because it provides only a small percentage of the entire habitat for this species within the Algodones Dunes and the area provides less available habitat for this plant relative to the areas south of State Route 78 that have in the past or may in the future be open to OHV use. Based on the 2005 population estimates derived by the BLM, less than 9 percent of the *A. magdalenae* var. *peirsonii* population in the United States occurs within the Wilderness. The distribution of *A. magdalenae* var. *peirsonii* from pre-2003 surveys indicates a higher relative abundance of plants in the central dunes south of State Route 78 and more recent surveys confirm this observation. Thus, the Wilderness alone is not sufficient to sustain this species because it does not provide sufficient habitat and habitat quality to ensure the long-term survival of this species, and the long-term viability of the species within the Wilderness is dependent upon the remainder of the range remaining viable. Thus, although direct impacts from OHV use are minimal within the Wilderness, the overall impacts to *A. magdalenae* var. *peirsonii* within the Wilderness that may result from the combined threats discussed above (including indirect effects of OHV use) are essentially equal to those present throughout the rest of the species' range.

Applying the process described above under ''Significant Portion of the Range Analysis'' for determining whether a species is threatened or endangered in a significant portion of its range, we next address whether any portions of the range of *Astragalus magdalenae* var. *peirsonii* warrant further consideration. As explained above, we have determined that *A. magdalenae* var. *peirsonii* remains threatened throughout all of its range due to the direct mortality, reduced survival, and/or reduced reproductive success that we predict would result from the effects of the identified threats analyzed in the five-factor analysis. We do not have any data suggesting that the identified threats to the species are concentrated in any portion of the range such that *A. magdalenae* var. *peirsonii* may be in danger of extinction in that portion. Therefore, we find that there are no portions of the range that warrant further consideration.

After a thorough review and consideration of all information available, we find that delisting *Astragalus magdalenae* var. *peirsonii* is not warranted at this time because the plant continues to be at risk due to the threats described above. We find that *A. magdalenae* var. *peirsonii* remains likely to become an endangered species within the foreseeable future throughout all of its range and should remain classified as a threatened species. In making this determination, we have followed the procedures set forth in section 4(a)(1) of the Act and regulations implementing the listing provisions of the Act (50 CFR part 424).

We will continue to monitor the status of the species, and to accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning this finding.

References Cited

A complete list of all references cited in this document is available upon request from the Carlsbad Fish and Wildlife Office (see **ADDRESSES**).

Author

The primary author of this document is Lloyd B. McKinney of the Carlsbad Fish and Wildlife Office (see **ADDRESSES**).

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

Dated: July 2, 2008.

Kenneth Stansell,

Acting Director, Fish and Wildlife Service.

[FR Doc. E8–16041 Filed 7–16–08; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 23

[FWS-R9-IA-2008-0003] [96000-1671-0000-P5]

RIN 1018-AV70

Revision of Regulations Implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Import and Export of Sturgeon Caviar

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the Fish and Wildlife Service (FWS), propose to revise the regulations that implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) by incorporating certain provisions related to international trade in sturgeon caviar adopted at the fourteenth meeting of the Conference of the Parties (CoP14) to CITES. We propose to reduce the quantity of caviar that may be imported or exported under the CITES personal effects exemption and amend the requirements for import of caviar from shared stocks subject to quotas. These changes would bring U.S. regulations in line with revisions adopted by consensus at the most recent meeting of the Conference of the Parties to CITES (June 2007). The revised regulations would help us more effectively promote species conservation, help us continue to fulfill our responsibilities under the Treaty, and help those affected by CITES to understand how to conduct lawful international trade in sturgeon caviar.

DATES: We will accept comments received on or before August 18, 2008.

ADDRESSES: You may submit comments by one of the following methods:

• Federal eRulemaking Portal: *http://www.regulations.gov*. Follow the instructions for submitting comments.