

*Oenothera californica* ssp. *eurekensis*  
(=*O. avita* ssp. *eurekensis*)  
**Eureka Valley evening-primrose**

**5-Year Review:  
Summary and Evaluation**



*Gerald and Buff Corsi © California Academy of Sciences*

**U.S. Fish and Wildlife Service  
Ventura Fish and Wildlife Office  
Ventura, California**

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## 5-YEAR REVIEW

### Eureka Valley evening-primrose / *Oenothera californica* (Wats) Wats. ssp. *eurekensis* (Munz and Roos) W. Klein

#### 1. GENERAL INFORMATION

##### 1.1. Methodology used to complete the review

Brian Croft, of the Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service (Service), collected all information that has become available since the time of listing. This review considered peer-reviewed literature, California Department of Fish and Game, Bureau of Land Management (Bureau), and National Park Service (NPS) reports, and personal communications with current and former staff of Death Valley National Park (Park). A site visit was also performed to assess the current level of threats and the current distribution of populations within Eureka Valley. We based this review primarily on the level of threats currently present within the Eureka Valley.

##### 1.2. Reviewers

**Lead Region** California/Nevada Operations Office  
**Contact** **Diane Elam and** Mary Grim (916-414-6464)

**Lead Field Office** Ventura Fish and Wildlife Office  
**Contact** Brian Croft (805-644-1766 ext. 302); Connie Rutherford, Listing and Recovery Coordinator (805-644-1766 ext. 306)

##### 1.3. Background

**1.3.1. FR Notice citation announcing initiation of this review:** The FR notice initiating this review was published on July 7, 2005 (70 FR 39327). This notice opened a 60-day request for information period, which closed on September 6, 2005. A second FR notice was published on November 3, 2005 (70 FR 66842), which extended the request for information period for an additional 60 days until January 3, 2006. No new information was received as a result of these notices.

##### 1.3.2. Listing history

###### Original Listing

FR notice: 43 FR 17910

Date listed: The final rule was published April 26, 1978 and became effective May 27, 1978.

Entity listed: Subspecies (*Oenothera avita* ssp. *eurekensis*)

Classification: Endangered

**1.3.3. Associated actions:**

No associated actions have occurred. We have never designated critical habitat for this species.

**1.3.4. Review History:**

The Service performed a status review for this species in 1994 (Noel 1994), and concluded that downlisting was warranted. However, the Service did not publish a proposed rule to downlist this species because the 1994 Desert Protection Act passed these lands to the NPS. At that time, the Service was uncertain about how NPS would manage the threats to this species.

**1.3.5. Species' Recovery Priority Number at start of review:**

The Eureka Dunes evening-primrose has a recovery priority of 9, which it is a subspecies with a moderate degree of threat and a high recovery potential.

**1.3.6. Recovery Plan or Outline**

Name of plan: Eureka Valley Dunes Recovery Plan (Service 1982)

Date issued: December 13, 1982

Dates of previous revisions: No revisions have been made.

**2. REVIEW ANALYSIS**

**2.1. Application of the 1996 Distinct Population Segment (DPS) policy**

**2.1.1. Is the species under review listed as a DPS?**

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listings as distinct population segments (DPS) only to vertebrate species of fish and wildlife. Because the species under review is a plant and the DPS policy is not applicable, the application of the DPS policy to the species listing is not addressed further in this review.

## 2.2. Recovery Criteria

### 2.2.1. Does the species have a final, approved recovery plan containing objective, measurable criteria?

The species has an approved recovery plan. However, the criteria, identified by the plan as “primary objectives,” are not measurable criteria pertaining to specific threats (i.e., eliminate OHVs or sandboarding within habitat) or species attributes (i.e., population size, density, etc.). They are general in nature and are not in accordance with current standards.

### 2.2.2. List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information. For threats-related recovery criteria, please note which of the 5 listing factors are addressed by that criterion. If any of the 5 listing factors are not relevant to this species, please not that here.

**Objective A** - protect the extant populations from existing and potential human threats.

The Bureau and the Park have protected all extant populations of this species from off-highway vehicles, sandboarding, horseback riding, camping, collection, and other human threats by establishing wilderness areas, instituting new Park policies, and enforcement of regulations. We were unable to find evidence that other human activities in the area were threatening populations of this species. Achievement of this recovery criterion addresses Factors A, B, D, and E of the 5-factor analysis (see Section 2.3.2). We could find no information to suggest that Factor C (disease or predation) was relevant to this species.

**Objective B** - determine the number of individuals/populations/acres of habitat necessary for each species to maintain itself, without intensive management, in a vigorous, self-sustaining manner within their natural historical dune habitat (estimated at 6,000 acres) (Service 1982).

We consider Objective “B” to be a recovery action item rather than a measurable recovery criteria.

## 2.3. Updated Information and Current Species Status

### 2.3.1. Biology and Habitat –

The Eureka Valley evening-primrose (*Oenothera californica* ssp. *eurekensis*) is a short-lived perennial in the Onagraceae Family that spends most of the year as a small rosette of leaves. During years with sufficient rainfall, plants undergo rapid stem elongation in April and May and bloom between April and July. Following

the blooming period, the elongated stems die back and are buried by shifting sands. With additional summer or fall rainfall, plants sometimes bloom again in the fall (Bagley 1986).

### ***Spatial Distribution***

In general, the Eureka Valley evening-primrose occupies the stabilized, gentle dune slopes, extending out onto the shallower sand fields bordering the dune systems of Eureka Valley, Inyo County, California (Bagley 1986). These occupied systems include the Eureka Dunes, Saline Spur Dunes, and Marble Canyon Dunes, all of which are currently under the jurisdiction of Death Valley National Park. This area was formerly under the jurisdiction of the Bureau. The geographic distribution of this species within Eureka Valley has not substantially changed since the time of listing, indicating that the species is likely stable on a rangewide scale. For additional information regarding survey efforts that have located this species since the time of listing, see Appendix A.

### ***Abundance and Population Trends***

The Bureau of Land Management (Bureau) and Death Valley National Park (Park) have not been able to determine trends in population size for this species because they have not had the resources to institute adequate monitoring. Bagley (1986) collected some baseline density information at permanent plots on the Eureka Dunes and at two satellite dune populations (Marble Canyon and Saline Spur Dunes), but given the small sample size and high degree of variability in the results, these values could not be extrapolated to estimate the size of the population. Mark Bagley and Connie Rutherford resurveyed these plots in 1988, but they did not analyze the data to determine trends (C. Rutherford, U.S. Fish and Wildlife Service, pers. comm. 2006). The Park has not instituted any formal monitoring efforts to repeat or expand on Bagley's work.

The ability of this species to increase its population size through production of vegetative shoots that appear to be new individuals, its high seed productivity, and long seed viability provide for dynamic populations that can dramatically increase and decrease in size from year to year (Pavlik and Barbour 1986). With the exception of seed longevity, there is evidence to suggest these factors are likely regulated by the amount and timing of rainfall. Mass germination events for this species may only occur every 8 to 10 years and seem to coincide with years of high rainfall (Pavlik and Barbour 1986).

### ***Survivorship and Demography***

Pavlik and Barbour (1988) concluded that populations were stable to increasing because survivorship data showed that even short-lived cohorts were able to reproduce. They observed that copious seed production, long-lived seeds, low to moderate seed predation, and frequent establishment offset the high mortality rates within this species. Based on half-life estimates (the time in which a population decreases by 50 percent), they estimated that the Eureka Valley evening-primrose might persist from 3 to 16 years in the absence of any recruitment (Pavlik and Barbour 1986).

With regard to age class distribution within this species, it appears that subadult plants may predominate. Pavlik and Barbour (1986) concluded that Eureka Valley evening-primrose could potentially have germination of new seeds every year, but successful establishment and formation of reproductive individuals probably only occurred every 2 to 4 years. This information, along with Pavlik and Barbour's half-life estimates, indicates that recruitment from year to year is likely low; however, high recruitment each year is probably not necessary to ensure stability.

### ***Seed Production and Seedbank Ecology***

Pavlik and Barbour (1986) noted that short-lived cohorts produced large amounts of seed when compared to cohorts with high survivorship, which produced relatively smaller amounts of seed. Consequently, years with low survival may actually produce seed numbers equal to or better than years with high survival. Although there is no evidence of a large stable seed bank for this plant at Eureka Dunes, the seeds can remain viable for up to 8 years (Pavlik and Barbour 1985). The top 15 centimeters of dune sand contains a small seedbank that has considerable seasonal variability, but the potential presence of a large stable seedbank in the lower layers of dune sand cannot be dismissed (Pavlik and Barbour 1985). In addition, a portion of the seeds produced by Eureka Valley evening-primrose does not disperse from the seed capsules and is reburied with the parent plant when it goes dormant (Pavlik and Barbour 1985). This ensures that at least some seeds remain at currently established plant clusters to aid in continued replenishment while other seeds disperse and potentially form new populations.

### ***Taxonomy***

The Service originally listed this species as *Oenothera avita* ssp. *eurekensis* (Eureka evening-primrose)(43 FR 17910). It is currently listed as *Oenothera avita* ssp. *eurekensis* (Eureka Valley evening-primrose)(50 CFR 17.12). However, Wagner (*in* Hickman 1993) reclassified some of the *Oenothera* species in the Jepson Manual of the Flowering Plants of California. This classification renamed the Eureka Valley evening-primrose as *Oenothera californica* ssp. *eurekensis*. This is currently the accepted name.

### ***Habitat Condition***

Quantitative monitoring data to document changes in habitat extent or distribution for this species is not available. However, because the species relies on dune systems, the amount and distribution of habitat has not likely changed substantially since the time of listing. The geographic extent of the sand dune systems within the Eureka Valley amounts to 19 square miles (Dean 1978), but only a fraction of that can be considered suitable habitat for the Eureka Valley evening-primrose. Since 1976, the control of off-highway vehicle (OHV) use, removal of campground facilities, and management of other visitor uses that may adversely affect the species has likely resulted in an increase in suitable habitat available to the Eureka Valley evening-primrose.

Despite these improvements, all of the populations have been invaded by barbwire Russian thistle (*Salsola paulsenii*), which could potentially affect the suitability of Eureka Valley evening-primrose habitat (see Section 2.3.2.e). It is unknown if and/or how these infestations are affecting the suitability of habitat in the areas where they are present, but infestations do not preclude robust populations of Eureka Valley evening-primrose (Dana York, Umpqua National Forest, pers. comm. 2005).

### ***Conservation Actions Taken to Protect Populations and Habitat***

Since the time of listing, control of OHV use, camping, and other human activities in Eureka Valley by the Bureau and the Park has resulted in increased suitability of available habitat in most areas. Prior to listing, the Eureka Valley had no formal land use designation and the area was open to unrestricted OHV recreation. During the 1960s, the type of use at the Eureka Dunes changed from non-motorized to motorized recreation. During this time, recreational use increased markedly and indiscriminate OHV use of the dunes began to exhibit a destructive effect on the dune vegetation. The Eureka Dunes became a favorite challenge to OHV enthusiasts, while other forms of recreation declined (Service 1982).

Following the publication of the proposed rule to list this species, the Bureau closed the Eureka Dunes and some of the surrounding area to OHVs in 1976. In 1980, the Bureau designated the Eureka Dunes and some of the surrounding area as an Area of Critical Environmental Concern (ACEC). Through the management plan for this ACEC, the Bureau designated campsites, increased ranger patrols to enforce the vehicle closures, closed undesignated routes, installed vehicle barriers, performed monitoring, and instituted an educational outreach program (Bureau 1982). The Bureau's efforts resulted in few observed violations between 1979 and 1994 (Service 1982, Harris 1994, DeDeker 1994, and Stormo 1994 *in* Noell 1994). These successes prompted the Service to propose this species for downlisting in 1994. The Service withdrew this proposal after the 1994 Desert Protection Act passed management of this area to the Park because the Service did not know what actions the Park was going to take to manage the OHV threat.

Since transfer of the management of Eureka Valley from the Bureau to the Park, all of the dune systems within Eureka Valley have been designated as wilderness areas and illegal OHV use within these wilderness areas has occurred only on a sporadic basis. While this illegal use has occasionally occurred on the dunes, it has not approached levels seen prior to listing and has not resulted in any reported incidence of adverse effects to Eureka Valley evening-primrose populations. Despite the low level of non-compliance, the Park has continued to institute increased measures to completely eliminate this threat. In 1995, the Park began regular ranger patrols, raked tracks in closed areas, removed routes that were now within wilderness areas, fixed fences, limited the use of roads on the west side of Eureka Dunes, installed new barriers, and installed educational signs (NPS *circa* 1999). In 2001, the Park completed a site improvement project that moved camping and parking facilities further away from the base of Eureka Dunes and closed all routes that accessed the base of this dune system (NPS 2000). In



addition, the Park has prohibited sandboarding and horseback riding on the dunes because of the potential for this activity to adversely affect populations of this species (NPS 2006).

### **2.3.2 Five Factor Analysis (threats, conservation measures and regulatory mechanisms)**

#### **a. Present or threatened destruction, modification or curtailment of its habitat or range:**

##### ***OHV Recreation***

At the time of listing in 1978, the Service identified OHV recreation as the primary threat to this species. Eureka Valley evening-primrose suffers moderate to heavy damage from a single pass of an off-road vehicle and loss of growing tips and/or floral structures from this damage has profound effects on the population dynamics of this species (Pavlik 1979). In addition, impacted plants are less likely to survive and set seed in subsequent blooming seasons (Pavlik 1979).

Prior to listing, slopes ascending the Eureka Dunes were used for OHV access to higher dune ridges, OHV activity fanned out between campsites and the dune slopes, and other OHV activity occurred around the perimeter of the Eureka Dunes (Service 1982). Following publication of the proposed listing rule, the Bureau closed the main Eureka Dunes and part of the surrounding area to OHVs (43 FR 17910). The closures and management have continued and increased under the Park's management and all populations of this species are now within designated wilderness areas that prohibit OHVs. The management of the OHV threat at the Eureka Dunes by the Bureau and the Park has resulted in a noticeable decrease in OHV impacts at the Eureka Dunes (see Section 2.3.2.d). The remote location, inaccessibility, and wilderness status of the Saline Spur Dunes and Marble Canyon Dunes appears to be providing sufficient protection for dune habitats at these locations. Relative to pre-listing levels, the decrease in OHV activity in the area has greatly reduced the threat to the species. Documented occurrences of illegal OHV use are sporadic and almost entirely localized to areas on and adjacent to the northern end of the Eureka Dunes, and have resulted in no documented cases of adverse effects to Eureka Valley evening-primrose populations under Park management (NPS *circa* 2000, Beymer 1996, Beymer 1997b-g, Peterson 1998b-c, Dellingers 1998a-c, Anderson 1998, Rods 1998, Rods 2000).

The Service recently allocated \$88,000 in "Showing Success" recovery funding for the implementation over the next year of final recovery actions for the Eureka Dunes evening-primrose and the endangered Eureka Valley dunegrass (*Swallenia alexandrae*). These actions will focus on taking the last steps needed to ensure the recovery of these two species, and will include installation of signs and boundary markers to control vehicle use, restoration of OHV-damaged areas, increased visitor education, and population monitoring of these two species. Although the current level of OHV activity and other human threats has been

significantly reduced since the time of listing, the implementation of these final recovery actions will assist the Park in reducing these threats and update information on the status of these species that will ensure delisting is warranted. This funding also will help address recommendations for future actions identified in section 4 of this review.

### ***Horseback Riding and Sandboarding***

In the late-1990s, Park staff became concerned about horseback riding on the Eureka Dunes because of the potential for this activity to result in damage to Eureka Valley evening-primrose. Pavlik (1979) concluded that individuals of this species were less likely to survive the summer months after being crushed by a single pass from an OHV. There is no information regarding the extent of the horseback riding threat during this period or specific scientific evidence related to the adverse effects of trampling by horses. However, the Park considered potential adverse effects from horseback riding to be similar to those of low to moderate OHV use, and prohibited this activity in 2002 (Croissant 2005, NPS 2006). The Park has not reported incidence of adverse effects to the Eureka Dunes evening-primrose due to horseback riding.

During this same period, the sport of sandboarding became more popular, and Park staff and visitors noticed an increase in this activity at the Eureka Dunes. An article in an October 1997 issue of *Esquire Magazine* identified Eureka Dunes as a location to pursue this activity. Between 1997 and 1999, Park staff observed 10 instances of sandboarding on the dunes and there were a handful of other complaints from the public regarding this activity (NPS circa 2000). There is no information regarding the extent of the adverse effect that this activity had on the Eureka Valley evening-primrose, but crushing of other sensitive species within the area was noted in 1997 (Beymer 1997h). Due to the need for steep dune slopes for sandboarding, it is unlikely that this activity resulted in substantial impacts to Eureka Valley evening-primrose because this species is typically found in gently sloping areas. However, the Park considered the potential adverse effects of sandboarding on other sensitive species in the Eureka Valley, and prohibited this activity in 2002 (Croissant 2005, NPS 2006). The Park has not reported incidence of adverse effects to the Eureka Dunes evening-primrose due to sandboarding.

### ***Campgrounds and Access Routes***

After listing of this species, it became evident that an access road that reached the Eureka Dunes at its northwest corner was aiding illegal OHV activity. The end of this route became the focal point of OHV activities and the site where most impacts to habitat originated (Service 1982). The recovery plan also indicated that camping along the perimeter of the dunes was a minor threat that land managers should address. It recommended the prohibition of camping on the dunes, enforcement of OHV prohibitions, establishment of defined camping areas away from the dunes, and transformation of the northwest access point into a day use only area. The Bureau and the Park have implemented the recommendations regarding camping and the access route at the northwest access point (NPS 2000, NPS 2006). The Park continues to enforce the wilderness closures that prohibit

OHV use on the dunes. Due to the Park's continued enforcement of OHV prohibitions that began under Bureau management, OHV incursions are sporadic and have not resulted in any documented damage to the Eureka Valley evening-primrose (NPS *circa* 2000, Beymer 1996, Beymer 1997b-g, Peterson 1998b-c, Dellingers 1998a-c, Anderson 1998, Rods 1998, Rods 2000).

**b. Overutilization for commercial, recreational, scientific, or educational purposes:**

The Eureka Valley evening-primrose has no known commercial or recreational value that the Service would consider consumptive. Educational groups frequently visit the Eureka Dunes, but the Service and the Park are unaware of any activities that would be consumptive to the point of overutilization. Since listing, there have been a handful of permit requests for studies involving consumptive uses of plants, seeds, or plant parts. These studies usually involve collection of seeds for laboratory experiments or collection of voucher specimens for herbaria. From our review of the number of requests, it does not appear that this level of research and collection rises to the level of overutilization.

**c. Disease or predation:**

Pavlik and Barbour (1985) estimated that, of the plants they observed, black-tailed jackrabbits (*Lepus californicus*) grazed 50 to 60 percent of the Eureka Valley evening-primrose. They also indicated that this grazing resulted in loss of some plants, but they did not determine the overall frequency of plants that died from herbivory. However, they suggested that herbivory could result in a substantial loss of seeds entering the seed bank if peak herbivory coincided with peak seed production in a given season. Although Pavlik and Barbour (1985) identified this potential threat, there is no information to indicate that the amount of herbivory has increased since the time of listing; therefore, we do not consider herbivory to be a significant threat.

**d. Inadequacy of existing regulatory mechanisms:**

All areas containing populations of the Eureka Valley evening-primrose are currently on lands managed by the Park and are within designated wilderness areas. The Wilderness Act of 1964 provides the Park with the legal authority and regulatory mechanisms to prevent OHV access into habitat for this species. The Park has prohibited other activities, such as sandboarding and horseback riding that potentially have adverse effects to populations of this species (NPS 2006). Therefore, the Park currently has legal mechanisms in place to enforce management of human threats to the Eureka Valley evening-primrose. In addition, any proposed activities or changes in management within the Eureka Valley would require review under the National Environmental Policy Act, which would require an analysis of the impacts of the action on the Eureka Valley evening-primrose.

Park staff have reported sporadic incidents of OHV incursions into wilderness areas under these restrictions. A review of incident and site visit reports, covering 1996 through early 2000, revealed 19 reports of non-compliance with existing vehicle closures at the Eureka Dunes and one report for Marble Canyon (NPS *circa* 2000, Beymer 1996, Beymer 1997b-g, Peterson 1998b-c, Dellingers 1998a-c, Anderson 1998, Rods 1998, Rods 2000). During this period, staff of the Park were visiting the Eureka Dunes and performing vehicle and foot patrols an average of 2 to 3 times a month. The main location of OHV activity, as the recovery plan noted, is still at the north end of the Eureka Dunes, but we were unable to find any reports of impacts to Eureka Valley evening-primrose populations. From this information, we conclude that the regulatory provisions of the Wilderness Act are adequate to deal with the OHV threat to Eureka Valley evening-primrose populations. We do not have any reports of noncompliance with the sandboarding or horseback riding restrictions. Under the Park's current management, we believe the Park's enforcement of existing regulatory mechanisms is adequate and factor d is not a threat.

**e. Other natural or manmade factors affecting its continued existence:**

***Russian Thistle Invasion***

There has been concern over invasion of the Eureka Valley by barbwire Russian thistle since the late-1980s (Service 1990). It appears that this invasion is recent or that it goes through cycles of expansion and contraction. Bagley 1994 (*in* Noell 1994) reported that it was not widespread in 1984 or 1985, but by the late-1980s, it had invaded prime habitat for this species at Eureka Dunes and was also present in Marble Canyon. Bagley (1986) indicated that Russian thistle densities on his plots were between 20 and 800 plants per hectare, but from casual observation, he thought the former number was more representative of the dunes as a whole. Peterson (1998a) noted Russian thistle on the north end of the Eureka Dunes and throughout Marble Canyon. Dana York also indicated that there were areas of Russian thistle infestation on the southern end of the Eureka Dunes, but also noted that there was a robust population of Eureka Valley evening-primrose at this site (Dana York pers. comm. 2005). In 2006, Service staff observed large amounts of Russian thistle remnants that had accumulated in depressions on the Marble Canyon Dunes and in the washes to the west of this dunes system (Croft *in litt.* 2006). They also observed lesser amounts on the Saline Spur Dune. In both cases, however, staff was able to find Eureka Valley evening-primrose growing in areas that contained Russian thistle remnants.

In all cases, the distribution of Russian thistle appears to be similar to that of the Eureka Valley evening-primrose in that it grows on the lower slopes and sandy flats of the dune systems. We have no information regarding potential effects of this plant on the stability of populations of the Eureka Valley evening-primrose; nevertheless, Eureka Valley evening-primrose continues to occupy infested areas (Dana York pers. comm. 2005). Therefore, we do not consider Russian thistle a substantial threat to this species at this time.

### *Stochastic Events*

In addition to the above threats, it is possible that certain stochastic events could occur that would affect Eureka Valley evening-primrose populations. These events could include violent windstorms that uproot plants, extended drought, and/or a combination of these events with other unidentified catastrophic events. It is unlikely that the Park could institute effective management measures to prevent or reduce the effects of these events, but the presence of three separated populations allows for some protection against rangewide die-offs. The possible exception would be prolonged drought within the Eureka Valley that would likely lead to effects across the entire range of the species. The long seed viability of this species, however, would likely provide a buffer against this event if seed is retained in the seedbank. Therefore, we do not believe stochastic events to be a substantial threat.

## **2.4. Synthesis**

At the time of listing, OHV use at Eureka Dunes was the primary threat to the Eureka Valley evening-primrose. Since the time of listing, a number of land management changes have occurred in the dunes that have eliminated this threat. The land has been acquired by the Park and designated as a wilderness area which prohibits all OHV use in the plants' habitat. The Park has modified camping and access routes in the area, further reducing potential impacts to the plants' habitat. Although some violations of existing vehicle closures continue to occur on a sporadic basis, there is little evidence to suggest that this is having a substantial effect on all or a significant portion of the species' range. To implement final recovery actions addressing these issues over the next year, the Service has allocated \$88,000 in "Showing Success" recovery funding for installation of signs and boundary markers to control vehicle use, restoration of OHV-damaged areas, increased visitor education, and population monitoring of the Eureka Valley evening-primrose and the Eureka Valley dunegrass.

The Park has identified horseback riding and sandboarding as a potential threat to the plant due to increases in these activities in the area. We were unable to find evidence that horseback riding and sandboarding has had a substantial adverse effect on the status of this species. The Park prohibited these activities in 2002.

Russian thistle has been located at all three populations for this species, but we were unable to find any evidence that its presence is having an adverse effect on the status of this species in all or a significant portion of its range.

We conclude that the Eureka Valley evening-primrose no longer requires the protections of the Endangered Species Act and should be delisted. From our review, we were unable to find current evidence of substantial adverse effects from documented threats that historically impacted this species. We were also unable to identify any adverse effects from other activities that have been cited as potential threats. Current protection of all populations by wilderness designations and current Park management has resulted in few documented instances of adverse effects to individual plants and no effects that would significantly affect the species as a whole.

### 3. RESULTS

#### 3.1. Recommended Classification:

- Yes, downlist to Threatened
- Yes, uplist to Endangered
- Yes, delist
- No, no change is needed

#### 3.2. New Recovery Priority Number: 15

This subspecies currently has a low degree of threat, a high potential for recovery, and little economic conflict.

#### 3.3. If applicable, indicate the Listing and Reclassification Priority Number:

**Delisting (Removal from list regardless of current classification) Priority Number:** 6

The delisting priority number should be a priority 6 because the status of this species as endangered has little effect on the Park's management of the Eureka Valley and this species was not petitioned for delisting.

### 4. RECOMMENDATIONS FOR FUTURE ACTIONS -

Initiate development of a five-year post-delisting monitoring plan, which should address the following:

1. Establish a monitoring program at all three populations to track changes in the extent and location of the Eureka Valley evening-primrose.
2. Continue monitoring and documentation of visitor use at all populations of this species, with special emphasis on tracking non-compliance issues.
3. Establish a monitoring program to track the extent, location, and relative density of Russian thistle infestations.
4. Initiate a program to determine if negative competitive relationships are occurring between Russian thistle and Eureka Valley evening-primrose.
5. Develop a management plan for the Eureka Valley that incorporates the monitoring strategies identified in the five-year post-delisting plan, and establishes specific management prescriptions for the Eureka Valley. These prescriptions should incorporate all of the management activities that are already occurring in the valley, but should also identify specific measurable objectives and adaptive management strategies to ensure continued success.

## 5. REFERENCES

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## Appendix A: Spatial Distribution over Time

### *Late-1970s and Early-1980s*

At the time of listing, there were three known populations within the Eureka Valley, but the majority of the distribution was on the Eureka Dunes (43 *Federal Register* 17910). Populations were known from Marble Canyon, the sands at the base of the Saline Range (Saline Spur Dune), and on the Eureka Dunes (Pavlik 1979, Service 1982, Rowlands 1982). The most extensive population in the early 1980s was east of the large ridge of the Eureka Dunes. Populations to the north and west of the high ridge previously suffered severe damage from OHVs prior to the Bureau's closure of the area to OHVs in 1976 (Service 1982).

### *Mid-1980s*

Bagley (1986) found no change in the distribution of the Eureka Valley evening-primrose on Eureka Dunes, but noted differences in the mapped distributions on the Saline Spur Dune and Marble Canyon Dune. Service (1982) had previously mapped the distribution of this species along the entire eastern edge of the Saline Spur Dunes, but Bagley (1986) found Eureka Valley evening-primrose only in the eastern portion of section 31 and in section 36. On the Marble Canyon Dunes, Bagley (1986) found it in areas that Service (1982) had mapped previously, but also found it to cover other areas of the dunes that they did not identify.

### *Late-1990s*

Maps presented to the Service by Peterson (1998a) show a very similar distribution of Eureka Valley evening-primrose in Marble Canyon to that observed by Bagley (1986), with all observed Eureka Valley evening-primrose in the eastern portion of section 20, the southern portion of section 17, and the western portion of section 21. Peterson (1998a) also provided the Service with a map showing the distribution of Eureka Valley evening-primrose on the north end of Eureka Dunes. It shows that this species persisted in this area as noted in previous surveys reports (Service 1982, Rowlands 1982, Pavlik and Barbour 1985, Pavlik and Barbour 1988, Bagley 1986). In addition, the Park mapped this species on the Saline Spur Dune in 1997 (Beymer 1997a).

### *2006*

In April of 2006, Service staff visited the Saline Spur and Marble Canyon populations and noted the presence of Eureka Valley evening-primrose at both locations. Due to many observations of this species at the Eureka Dunes by Park staff in recent years, Service staff did not visit this site.

**U.S. FISH AND WILDLIFE SERVICE**  
**5-YEAR REVIEW of Eureka Valley Evening Primrose**  
*(Oenothera californica ssp. eurekaensis)*

**Current Classification:** Endangered

**Recommendation resulting from the 5-Year Review**

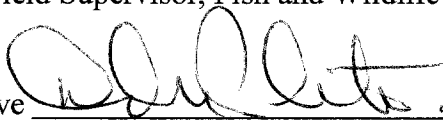
- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change is needed

**Appropriate Listing/Reclassification Priority Number**   6  

**Review Conducted By**   Brian Croft  

**FIELD OFFICE APPROVAL:**

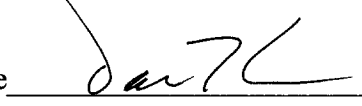
Lead Field Supervisor, Fish and Wildlife Service

Approve  acting Date   7/31/07  

**REGIONAL OFFICE APPROVAL:**

Acting

Regional Director, Fish and Wildlife Service

Approve  Date   9/24/07