

## 5-YEAR REVIEW

### Smith's Blue Butterfly (*Euphilotes enoptes smithi*)

#### GENERAL INFORMATION

**Species:** Smith's blue butterfly (*Euphilotes enoptes smithi*)

**Date listed:** June 1, 1976

**FR citation:** 41 FR 22041

**Classification:** Endangered

**Most recent status review:** The most recent status review of Smith's blue butterfly is a 5-year review completed by the Ventura Fish and Wildlife Office in 2006 (Service 2006).

#### **Methodology used to complete the review:**

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each listed species to evaluate whether or not the species' status has changed and it should be classified differently or removed from the List of Threatened and Endangered Wildlife. The U.S. Fish and Wildlife Service's (Service) Ventura Fish and Wildlife Office (VFWO) conducted a Species Status Assessment (SSA) for Smith's blue butterfly (Service 2020), which was used to inform this 5-year review. The SSA represents our evaluation of the best available scientific information, including the habitat and demographic needs and current and future condition of the species. Independent peer reviewers and partner representatives reviewed the SSA.

#### **FR Notice citation announcing this status review:**

A notice announcing the initiation of the 5-year review for this taxon and the opening of a 60-day period to receive information from the public was published in the Federal Register on June 18, 2018 (83 FR 28251).

#### REVIEW ANALYSIS

##### **Updated Information and Species Status**

New information since the 2006 5-year review is included in the SSA and summarized below; more detail and references can be found in the SSA report (Service 2020).

The Smith's blue butterfly is endemic to the central coast of California, within Monterey and northern San Luis Obispo Counties. The Smith's blue butterfly is an annual subspecies that primarily uses two species of buckwheat (*Eriogonum latifolium* and *E. parvifolium*) as host plants that grow in sand dunes and scrub, chaparral habitats. Each of its life stages relies upon the buckwheat, with adults feeding on nectar from the flowers and depositing eggs on the flowerheads, larvae feeding on the flowers and seeds, and pupae either forming in the soil or directly on the plants before dropping to the ground where they overwinter in leaf litter. In order for Smith's blue butterfly populations to maintain viability, they need healthy populations of their buckwheat host plants, coastal habitats with adequate levels of appropriate disturbance regimes to support the buckwheat, and connectivity between occupied spaces to facilitate natural recolonization.

## **Abundance and Distribution**

At the time of listing, the Smith's blue butterfly was thought to inhabit only the coastal sand dunes that extend from the mouth of the Salinas River south to Del Rey Creek in northern Monterey County. The 1984 Recovery Plan noted that since the Smith's blue butterfly was listed, additional surveys had located the subspecies in more diverse habitats, including coastal scrub and chaparral found in Carmel Valley and the Big Sur coast to the south.

Currently, Smith's blue butterflies are thought to occur in scattered colonies in coastal sand dunes, serpentine grasslands, and chaparral communities where their host plants are present in Monterey and San Luis Obispo Counties in two metapopulations. These two metapopulations are now likely isolated from one another, with the northern metapopulation inhabiting the dunes along Monterey Bay and the southern metapopulation reaching from the Carmel Valley, south into Big Sur. The two metapopulations are separated by development around the City of Monterey and the Monterey Peninsula. Smith's blue butterfly has never been documented in the gap between the two metapopulations and current habitat conditions indicate that development, tree planting, and fire suppression have likely reduced habitat suitability for Smith's blue butterfly in this area. The most recent survey efforts indicate that the gap between metapopulations is expanding.

The lack of Smith's blue butterfly survey data makes it difficult to discuss trends in the subspecies' spatial distribution. For most of the range of the subspecies, we do not have monitoring data from which a population trend could be determined and most sites have not been surveyed in recent years. However, surveys for Smith's blue butterflies have been conducted at the Salinas River National Wildlife Refuge from 2015 through 2019. Detections decreased for the first three years of surveys followed by a slight increase in 2018, and then a significant decrease in 2019. It is unknown if weather or some other stressor is causing the observed decline in detections. Continued monitoring is planned. Additional monitoring throughout the range is needed.

## **Threats**

At the time of listing, habitat loss and degradation due to housing developments and highway construction, heavy foot and vehicular traffic on Fort Ord Army Base, and the spread of introduced iceplant were identified as the primary threats to the species. At the time of the last 5-year review, we identified degradation and loss of habitat as a result of urban development, recreational activities, sand mining, fire suppression, and encroachment of invasive, nonnative vegetation as threats to the species.

In addition to the threats identified in the 2006 5-year review, we now consider the potential impacts of wildfire and factors related to climate change, especially increasing temperatures, drought, and sea level rise to be additional threats to the species. We no longer consider activities on Fort Ord Army Base to be a threat to the species as the coastal habitat formerly encompassed by the Fort Ord Army Base is now owned and managed by California State Parks (Fort Ord Dunes State Park).

Since the 2006 5-year review, several large fires have burned many thousands of acres of Smith's blue butterfly habitat in the southern metapopulation, including the 2008 Basin Complex fire, 2016 Soberanes Fire, and 2020 Dolan Fire. Smaller wildfires can create disturbances that favor establishment of the host buckwheats, while large, high-intensity fires are more likely to

damage soils and destroy seed banks to the detriment of native plant communities. Due to a lack of monitoring data, the effects of these fires on Smith's blue butterflies or their host buckwheats are unavailable. However, a large area of potential habitat has been burned and mortality of the species and removal of some habitat likely resulted. Given the 2020 Dolan Fire, we recommend taking this opportunity to monitor Smith's blue butterflies and their habitat use in this area to better understand the impacts of large-scale wildfire on the species and buckwheat host plants.

In a report prepared for the Monterey Bay Sanctuary Foundation, researchers incorporated multiple coastal hazards assessments to determine the effects of sea level rise on the Monterey Bay coastline. These results indicate that increased coastal erosion and wave run-up will remove low-lying Smith's blue butterfly habitat. The projected habitat lost could be 14 to 25 percent of the current range of the northern metapopulation of Smith's blue butterfly by 2060.

According to California's 4<sup>th</sup> Climate Change Assessment from 2018, average annual maximum temperatures in Monterey County are expected to increase between 3.5 and 5 degrees Fahrenheit based on Representative Concentration Pathway (RCP) 4.5 and 8.5. Climate projections also show an increase in extreme dry events and that drought conditions will increase. Increased drought is expected to lead to an increase in the intensity and size of wildfires, especially in grasslands and shrublands of California's coast and foothills. Warmer and dryer conditions and increased wildfire are also expected to lead to a reduction in shrub dominated habitats in the California Coast Ranges, including the scrub and chaparral habitats of the Smith's blue butterfly, favoring increased spread of invasive, nonnative vegetation.

### **Recovery Criteria**

The recovery plan for the Smith's blue butterfly was signed in 1984 (Service 1984, entire). Instead of recovery criteria, the plan includes a list of objectives, which are similar to the recovery criteria in more recent recovery plans. The objectives state that the Smith's blue butterfly would be considered eligible for delisting when either of the following two conditions has been met:

1. The Smith's blue colonies at all 18 sites identified in the recovery plan have been made secure. Colonies are considered secure when viable, self-sustaining populations have been maintained for a period of ten consecutive years and no foreseeable threats to the future survival of the colonies exist. If, after 10 consecutive years, these sites appear to be permanently protected and the butterfly colonies that occupy these sites no longer appear to be threatened, then the Smith's blue butterfly would qualify for delisting.
2. An equivalent number of Smith's blue colonies have been made secure at comparable alternative sites to insure the continued existence of the subspecies. The determination that a colony is secure and is comparable to sites listed in the recovery plan is to be based on the following criteria:
  - a) Status surveys are conducted that indicate the alternative colony is comparable in size and distribution to the colony listed;
  - b) Status surveys are conducted that indicate the alternative colony has, relative to one of the colonies listed, comparable opportunities for genetic exchange with other Smith's blues;
  - c) Genetic studies are performed that indicate there are no taxonomic differences between the alternative colony and the colony listed ; and

- d) Status surveys are conducted to document that a viable, self-sustaining population has been maintained at the alternative site for a period of 10 consecutive years and no foreseeable threats to the future survival of the colony exist.

The recovery plan states that downlisting of the Smith's blue butterfly's status to threatened would be considered when 10 of the 18 colonies mentioned in item #1 above have been made secure or when 10 colonies comparable to those sites have been secured, as described in item #2.

The recovery objectives focus on protection of known (as of 1984) localities. However, due to changes in our knowledge of the range and threats that Smith's blue butterfly faces, the objectives are no longer applicable to the whole range of the listed entity. The range is larger and shifted to the south relative to what was known in 1984, and several of the locations identified for protection in the recovery plan no longer have suitable habitat or are outside the currently accepted range.

The intent of the delisting objectives is that viable, self-sustaining populations across the range are maintained over time and that threats are ameliorated. The intent of the downlisting objective is that a proportion of the necessary populations for delisting are viable and self-sustaining over time and that threats are ameliorated.

Currently, the occupied range of the Smith's blue butterfly is significantly larger than was known at listing. However, most occupied sites were surveyed only once, and we have no substantial information on the persistence or viability of those occurrences. The primary threats currently impacting the species are habitat loss, degradation, and fragmentation due to (1) development (including sand mining) and (2) invasion by invasive, nonnative vegetation and overabundance of the habitat, (3) wildfires, (4) road and trail maintenance and use, (5) grazing, and (6) climate change, including sea level rise and increasing drought.

### **Synthesis**

In 2006, we completed a 5-year review for the Smith's blue butterfly (Service 2006, entire) and at that time, found sufficient evidence to recommend downlisting based on the following:

- The occupied range of the Smith's blue butterfly is larger than was known at the time the subspecies was listed and new occupied sites have been found throughout the southern part of its range.
- Since listing in 1976, some locations occupied by Smith's blue butterfly have been secured from residential or commercial development threats through public or non-profit conservation ownership and additional occupied locations have been located in the southern portion of the subspecies' range.

We did not recommend delisting Smith's blue butterfly because of ongoing threats, primarily related to habitat loss due to development (which was thought to be more prevalent in the northern portion of the subspecies' range) and invasion by non-native plants throughout the range.

Currently, the range of Smith's blue butterfly is significantly larger than was thought at the time of listing. However, most occupied sites were surveyed only once, and we have no substantial information on the persistence or resiliency of such occurrences. In terms of distribution, the lack of Smith's blue butterfly survey data makes it difficult to discuss trends in the subspecies' spatial distribution, although recent information indicates that the gap in the

range around the City of Monterey and Monterey Peninsula is expanding. In terms of population numbers, the nearly complete lack of data from population monitoring limits our ability to make assumptions or predictions regarding abundance. The majority of Smith's blue butterfly sightings are informal and do not allow for estimations of population size. The single continuous monitoring program at the Salinas River National Wildlife Refuge indicated a decline in detections over five years. We are unable to determine if the decrease in abundance was localized to the Salinas River National Wildlife Refuge or a range-wide trend.

At the time of the last 5-year review, we identified degradation and loss of habitat as a result of urban development, recreational activities, sand mining, fire suppression, and encroachment of invasive, nonnative vegetation as threats to the species (Service 2006, p. 14). In addition to the threats identified in the 2006 5-year review, we now consider the potential impacts of wildfire and factors related to climate change, especially sea level rise and increasing temperatures and drought to be additional threats to Smith's blue butterfly. We no longer consider activities on Fort Ord Army Base to be a threat to the species as the coastal habitat formerly encompassed by the Fort Ord Army Base is now owned and managed by California State Parks (Fort Ord Dunes State Park).

In summary, the occupied range of the Smith's blue butterfly is significantly larger than was known at the time the subspecies was listed, but we do not know if populations are resilient and self-sustaining. We forecast that threats to the future survival of the populations will likely increase without increased management. The threat of habitat loss caused by invasive, nonnative vegetation is considered a primary threat because it has the potential to remove habitat that is considered protected from development. Redundancy will always be limited for local, endemic species with a naturally limited range. Local populations throughout the two habitat types provide some level of protection from catastrophic events in each metapopulation in the face of increasing wildfire or catastrophic drought. However, wildfires since the last 5-year review have impacted a significant proportion of the southern metapopulation, albeit the effects are unknown. Given host-plant specificity, the subspecies has always had relatively limited representation. Having two host plant species and inhabiting both dunes and scrub or chaparral provides some ability to adapt as conditions change in the future. However, continued habitat degradation from invasive, nonnative vegetation and sea-level rise will likely reduce the potential for already relatively limited adaptive capacity.

In consideration of the identified threats and near complete lack of monitoring data and associated uncertainty, we conclude the Smith's blue butterfly still meets the Endangered Species Act definition of an endangered species, and we recommend no status change at this time.

## RESULTS

### Recommended Classification:

**Downlist to Threatened**

**Uplist to Endangered**

**Delist** (*Indicate reasons for delisting per 50 CFR 424.11*):

*Extinction*

*Recovery*

*Original data for classification in error*

**No change is needed**

### New Recovery Priority Number: No change

We recommend that the recovery priority number remain at 9C, which indicates a subspecies with a moderate degree of threat and a high potential for recovery. The C indicates conflict with construction or other development projects.

## RECOMMENDATIONS FOR FUTURE ACTIONS

1. Conduct surveys to quantify habitat and determine occupancy and population trends throughout the range of Smith's blue butterfly.
2. Evaluate the short and long-term effects of large-scale wildfire on Smith's blue butterflies and their host plants.
3. Implement long-term restoration, monitoring, and adaptive management at priority sites throughout the range to reduce the Smith's blue butterfly's risk from invasive, nonnative vegetation and overstabilization.
4. Conduct genetic analysis to identify subspecies limits.
5. Revise the recovery plan to reflect current knowledge of the subspecies' range and threats, and to stress the importance of habitat restoration and connectivity; update recovery criteria.

## REFERENCES

- [Service] U.S. Fish and Wildlife Service. 1984. Smith's blue butterfly recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon. 87 pp.
- [Service] U.S. Fish and Wildlife Service. 2006. Smith's blue butterfly (*Euphilotes enoptes smithi*) 5-year review: Summary and evaluation. Ventura, California. 29 pp.
- [Service] U.S. Fish and Wildlife Service. 2020. Smith's blue butterfly (*Euphilotes enoptes smithi*) Species Status Assessment. Version 1. April 2020. Ventura, California.

**U.S. FISH AND WILDLIFE SERVICE**  
**5-YEAR REVIEW of Smith's blue butterfly**  
**Current Classification: Endangered**

**Recommendation resulting from the 5-year review:**

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

**FIELD OFFICE APPROVAL:**

**Field Supervisor, Ventura Fish and Wildlife Office**

Approve \_\_\_\_\_