

(DRAFT) - Taxonomy
Species BUTTERFLY, BLUE, SMITH'S
Species Id ESIS501004
Date 13 MAR 96

TAXONOMY

NAME - BUTTERFLY, BLUE, SMITH'S
OTHER COMMON NAMES - BUTTERFLY, BLUE, SMITH'S; BLUE and SMITH
ELEMENT CODE -
CATEGORY - Terrestrial Insects
PHYLUM AND SUBPHYLUM - ARTHROPODA,
CLASS AND SUBCLASS - INSECTA,
ORDER AND SUBORDER - LEPIDOPTERA,
FAMILY AND SUBFAMILY - LYCAENIDAE,
GENUS AND SUBGENUS - EUPHILOTES,
SPECIES AND SSP - ENOPTES, SMITHI
SCIENTIFIC NAME - EUPHILOTES ENOPTES SMITHI
AUTHORITY -
TAXONOMY REFERENCES -

COMMENTS ON TAXONOMY -
Smith's Blue Butterfly

Euphilotes enoptes smithi (Mattoni, 1977)

KINGDOM:	Animal	GROUP:	Insect
PHYLUM:	Arthropoda	CLASS:	Insecta
ORDER:	Lepidoptera	FAMILY:	Lycaenidae

Smith's blue butterfly is small, slightly less than one inch across with wings fully spread. The undersides are whitish-gray, speckled with black dots and with a band of red-orange marks crossing the hind-wings near the outer edge. Sexual differences are seen on the upper wing surface. Males are bright lustrous blue, whereas females are brown above with a band of red-orange marks across the hind wings. Above, both sexes have prominently checkered fringes on both fore-wings and hind-wings, while males have wide black borders,

and a very hairy appearance of the body and adjacent wings (02). The subspecies is separated from others of the species by the light undersurface ground color with prominent overlying black markings and a faint black terminal line (01).

Accounts of Smith's blue butterfly include the original description (02), a non-technical overview of the genus *Euphilotes* by Pyle (03), a treatment and illustration by Howe (04), and papers by

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Species Id ESIS501004

Date 13 MAR 96

Langston (05,06,07,08), Shields (09,10), and Arnold (01).

Specimens are housed in the Museum of the California Academy of Science, University of California, Berkeley, and the LA County Museum (12).

Several generic names have been attached to the group of butterflies to which Smith's blue butterfly belongs. Mattoni (02) originally described this subspecies as *Philotes enoptes smithi*. In 1975, Shields realigned several genera. *Shijimiaeoides enoptes smithi* was the resulting name of the Smith's blue butterfly and was the name used when the species was listed in 1976. The group has most recently been revised by Mattoni (13) in another realignment of genera. This resulted in a generic name change to *Euphilotes*, Smith's blue butterfly has always been accepted as a valid geographic subspecies of the *enoptes* group which is widespread in the Western United States (01,04,11). Smith blue is another common name for this subspecies.

Taxonomy - 2

(DRAFT) - Status

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Species Id ESIS501004

Date 13 MAR 96

STATUS

Coded Status

E: Federal Endangered

COMMENTS ON STATUS -

U.S. STATUSES AND LAWS:

The Smith's blue butterfly (*Euphilotes enoptes smithi*) has been designated an Endangered species pursuant to the Endangered Species Act of 1973 (50 CFR 17.11; P.L. 93-205, 87 Stat. 884; 16 U.S.C. 1531-1540), as amended. The species has this status wherever found including the State of California.

This species is protected by the Lacey Act (P.L. 97-79, as amended; 16 U.S.C. 3371 et seq.) which makes it unlawful to import, export, transport, sell, receive, acquire, or purchase any wild animal (alive or dead including parts, products, eggs, or offspring):

- (1) in interstate or foreign commerce if taken, possessed, transported or sold in violation of any State law or regulation; or
- (2) if taken or possessed in violation of any U.S. law, treaty, or regulation or in violation of Indian tribal law.

It is also unlawful to possess any wild animal (alive or dead including parts, products, eggs, and offspring) within the U.S. territorial or special maritime jurisdiction (as defined in 18 U.S.C. 7) that is taken, possessed, transported, or sold in violation of any State law or regulation, foreign law, or Indian tribal law.

RESPONSIBLE FEDERAL AGENCIES:

- | | |
|-------|---|
| USFWS | -Responsible for the management/recovery, listing, and law enforcement/protection of this species. |
| DOD | -Responsible for the law enforcement/protection of this species with applicable State and Federal laws on public land under their control. Also responsible for management/recovery on Department of Defense lands. |
| USFS | -Responsible for the law enforcement/protection of this species with applicable State and Federal laws on public lands under their control. Also responsible for management/recovery on Forest Service lands. The Forest Service is responsible for integrating management, protection, and conservation of Federally |

listed species into the Forest Planning process
(36 CFR 219.19 and 219.20).

All Federal agencies have responsibility to ensure that any action authorized, funded, or carried out by that agency is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of Critical Habitat (50 CFR 402), and to utilize their authorities to carry out programs for the

Status - 1

(DRAFT) - Status
Species BUTTERFLY, BLUE, SMITH'S
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Date 13 MAR 96

conservation of the species.

STATE STATUSES AND LAWS:

STATE: California
DESIGNATED STATUS: None

The California Environmental Quality Control Act (CEQA) (PRC 2100 et seq.) recognizes Federally listed Threatened and Endangered species as among those species requiring environmental impact assessments be made for actions that may detrimentally affect them. See: Guidelines for Implementation of CEQA, CA Admin. Code, Ch. 3, Sec. 15380.

INTERNATIONAL STATUSES, TREATIES, AND AGREEMENTS:

None.

ECONOMIC STATUSES:

This species has recreational value to naturalists and has value as a component of California's natural heritage of biotic diversity.

75/03/20:40 FR 12691/ - Notice of review of status
75/10/14:40 FR 48139/48140 - Proposed listing as Endangered
76/06/01:41 FR 22041/22044 - Listing as Endangered
81/02/27:46 FR 14651/14658 - Five year review
87/07/07:52 FR 25523/25528 - Notice of review

Status - 2

HABITAT ASSOCIATIONS

HABITAT - TERRESTRIAL
TERRESTRIAL
COASTAL

SOCIETY OF AMERICAN FORESTRY TYPES

<u>SAF TYPE</u>	<u>STAGE</u>	<u>CLOSURE</u>
Interior Ponderosa Pine	young tree	
Interior Ponderosa Pine	mature tree	

LAND USE -

Transportation, communications, and Util
Mixed Urban or Built-up Land
Evergreen Forest Land
Sandy Areas other than Beaches
Strip Mines, Quarries, and Gravel Pits
Transitional Areas
Mixed Barren Land

COMMENTS ON HABITAT ASSOCIATIONS -

The three taxa of *Eriogonum*; *E. parvifolium* (seacliff buckwheat),
E. latifolium (coast buckwheat), and an undescribed ecotype of *E. latifolium* are obligate host plants, providing food to the larvae as well as cover. The plants also provide a layer of litter beneath the plants where pupation occurs (01).
The primary factor that limits populations of Smith's blue butterfly is the occurrence of host plants, seacliff buckwheat and coast buckwheat. The presence of the host plant, however, is not always an indication of the occurrence of the butterfly. The occurrence of these plants is much more extensive than the distribution of the butterfly. Age class distribution and density of host plant patches are also important to successful colonization and maintenance of butterfly colonies. The direct loss of preferred habitat for this species is the largest single reason for its status today. The butterfly occurs in 2 different habitat types; coastal sand dunes and cliff/chaparral.
Coastal sand dunes. The obligate host plant of the Smith's blue butterfly occur in coastal sand dunes in the Monterey Bay area. Associated species of plants are *Baccaris pilularis pilularis*, *Eriophyllum staechadifolium*, *Lupinus chamissonis*, *Happlopappus ericoides*, *Rhamnus californica*, and *Rhus diversiloba*. These species are dominant in the dune scrub vegetation where the butterfly is

found. The butterfly is in or adjacent to urban development, highways (Caltrans Highway right-of-way), recreational areas (Marina State Beach), Fort Ord Military Reservation, and past and present sand mining quarries (Sand City and Marina) in the coastal dunes habitat.

Cliff/chaparral. Buckwheats often occur in monotypic stands on cliff-sides. However, in chaparral sites, *Eriogonum* occurs with *Adenostoma fasciculata*, *Arctostaphylos* spp., and several *Ceanothus* species. The butterfly occurs in or adjacent to steep coastal cliffs

(Big Sur area); woodlands (ponderosa pine forest ecosystem) near Vasques Knob (USFS Los Padres NF); and U.S. Highway 1 right-of-way.

Some areas are subject to slope failure or slumping.

(DRAFT) - Food Habits
Species BUTTERFLY, BLUE, SMITH'S
Species Id ESIS501004
Date 13 MAR 96

FOOD HABITS

TROPHIC LEVEL -
HERBIVORE

<u>LIFESTAGE</u>	<u>FOOD</u>	<u>FOOD PART</u>
General	Evergreen Shrubs-Flowers/Fruit/Seed	

Food Habits - 1

(DRAFT) - Environment Associations
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Species Id ESIS501004
Date 13 MAR 96

ENVIRONMENTAL ASSOCIATIONS

G	=	General	A	=	Adult
LIM	=	Limiting	RA	=	Resting Adult
J	=	Juvenile	FA	=	Feeding Adult
RJ	=	Resting Juvenile	BA	=	Breeding Adult
FJ	=	Feeding Juvenile	P	=	Pupae
L	=	Larvae	E	=	Egg
RL	=	Resting Larvae			
FL	=	Feeding Larvae			

<u>LIFESTAGE</u>	<u>ENVIRONMENTAL ASSOCIATIONS</u>
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G	
G	Terrestrial Features: Talus
G	Terrestrial Features: Cliffs/ledges
G	Terrestrial Features: Rock outcrops

Environment Associations - 1

(DRAFT) - Life History
Species BUTTERFLY, BLUE, SMITH'S
Species Id ESIS501004
Date 13 MAR 96

LIFE HISTORY

FOOD HABITS:

Larvae of Smith's blue butterfly consume flowers of the obligate host plant *Eriogonum parvifolium* (seacliff buckwheat), *E. laetifolium*, (coast buckwheat) and an undescribed ecotype of *E. latifolium*. Adults utilize the flowers as primary nectar sources during the flight period (01).

HOME RANGE/TERRITORY:

The species is non-territorial.

PERIODICITY:

Adults are day flying. The flight season runs from mid-June to early September and is synchronized with the peak bloom of the host plant (01).

MIGRATION PATTERNS:

This species is nonmigratory and also has low vagility. Movement is generally observed to be less than 200 feet from the host plant upon which they were initially observed (01).

COVER/SHELTER REQUIREMENTS:

The three taxa of *Eriogonum*; *E. parvifolium*, *E. latifolium*, and the undescribed ecotype of *E. latifolium* are obligate host plants, and provide food to the larvae, as well as cover and a layer of litter beneath the plants where pupation occurs (01).

REPRODUCTIVE SITE REQUIREMENTS:

Mate location, courting, copulation and oviposition occur on the larval host plants. The host plants occur in sandy substrates found in the coastal sand dunes and the rocky substrates such as the cliff/chapparral areas. Reproduction and emergence do not take place until the buckwheat host plants are well into their blooming season (01).

REPRODUCTIVE CHARACTERISTICS:

Smith's blue butterfly has one extended flight season per year (univoltine). Emergence generally coincides with the peak flowering of the host plant. Males emerge first and the females emerge about a week later. Both sexes live about a year, and females appear to lay eggs throughout their adult life-span. Breeding is usually from late June to early September, generally about 40 days in duration, but can be affected severely by unseasonably cool or warm temperatures (01,11). Pairing (copulation) in the field averages

about 1.5 to 2.5 hours (11).

PARENTAL CARE:

No parental care takes place.

POPULATION BIOLOGY:

Limiting factors are essentially the persistence of, and butterfly access to suitable host plant populations for long enough

Life History - 1

(DRAFT) - Life History
Species BUTTERFLY, BLUE, SMITH'S
Species Id ESIS501004
Date 13 MAR 96

periods to support butterfly populations (01). Essentially no information exists concerning the viability of colonies over time. There appears to be a greater number of males than females in the coastal sand dune populations (11). Sex ratios in the other habitats have not been studied. Females generally fly farther than males, and males appear to "hang out" around the host plants waiting for a female to fly by (11). Recovery potential is good for this species. If several areas are set aside and managed for native flora and fauna, the subspecies may be recovered within a time period of 10 to 15 years. Acquisition and management programs will take at least that long to be put in place and become functional (01).

SPECIES INTERRELATIONSHIPS:

Smith's blue butterfly is obligate on *Eriogonum parvifolium*, *Eriogonum latifolium*, and an undescribed ecotype of *E. latifolium*. The plant used for larval food, adult nectaring, mate location, copulation and oviposition, as well as cover and shelter for pupation. Some lepidopterists consider the Santa Cruz County population of *Euphilotes enoptes* to consist of intermediates between Smith's blue butterfly (*E.e. smithi*) and Tilden's blue butterfly (*E.e. tildeni*).

The role of ant associations (myrmecophily) with the Smith's blue butterfly is unclear. Larvae are known to be tended by ants during their third and fifth instars. The larvae produce a secretion of sugar from abdominal glands that provides food for the tending ants. In return, the larvae are thought to derive some benefit, possibly protection from predation or parasitism. The loss of an obligate mutualistic relationship with an ant was crucial in the extinction of Britian's large blue butterfly (01).

OTHER LIFE HISTORY DESCRIPTORS:

This species goes through five instars in the larval stages, overwinters as a pupa and emerges as an adult in the springtime (11).

Life History - 2

MANAGEMENT PRACTICES

<u>RESULT</u>	<u>MANAGEMENT PRACTICE</u>
Beneficial	Controlling/Restricting Off-Road Vehicles
Beneficial	Restricting/regulating human disturbance of populations
Beneficial	Land Acquisition
Beneficial	Reforestation
Beneficial	Controlling/Removing Nonnative Vegetation
Beneficial	Transplanting wild animals
Adverse	Artillery/Explosions
Existing	Artillery/Explosions
Adverse	Off Road Vehicles
Existing	Off Road Vehicles
Adverse	
Existing	
Adverse	Food Supply Reduction
Existing	Food Supply Reduction
Adverse	Surface Mines
Existing	Surface Mines
Adverse	Rural Residential/Industrial Areas
Existing	Rural Residential/Industrial Areas
Adverse	Recreational development
Existing	Recreational development
Adverse	Highway/Railroads
Existing	Highway/Railroads
Adverse	Soil compaction by heavy equipment in mine areas
Existing	Soil compaction by heavy equipment in mine areas
Adverse	Shoreline modification/development
Existing	Shoreline modification/development
Adverse	Exotic/Feral/Introduced Species
Existing	Exotic/Feral/Introduced Species
Adverse	Erosion
Existing	Erosion
Adverse	Vegetation Composition Changes
Existing	Vegetation Composition Changes
Adverse	Suppressing wildfire
Existing	Suppressing wildfire

COMMENTS ON MANAGEMENT PRACTICES -

The primary factor that limits populations of Smith's blue butterfly is the occurrence of host plants, seacliff buckwheat (*Eriogonum parvifolium*) and coast buckwheat (*E. latifolium*). The presence of the host plant, however, is not always an indication of

the occurrence of the butterfly. The occurrence of these plants is much more extensive than the distribution of the butterfly. Age class distribution and density of host plant patches are also important to successful colonization and maintenance of butterfly colonies. The direct loss of preferred habitat for this species is the largest single reason for its status today. The butterfly occurs in 2 different habitat types; coastal sand dunes and cliff/chaparral. Therefore threats to each habitat area are indeed threats to the

(DRAFT) - Management Practices
Species BUTTERFLY, BLUE, SMITH'S
Species Id ESIS501004
Date 13 MAR 96

existence of the butterfly.

More than 50 percent of the Seaside-Marina dune system (coastal sand dune) has been destroyed or altered significantly by: sand mining; urbanization; military activities (i.e., explosions, trampling, ORV use, etc.); construction; recreational facilities/activities (i.e., foot traffic and hang glider use); off-road vehicles; and the introduction of exotic species (iceplant - *Carpobrotus* spp. and Holland dune grass - *Ammophila arenaria*) for sand dune stabilization. Also, dynamic dune succession dominated by native plants is necessary for maintenance of healthy, self-sustaining coastal sand dune populations of Smith's blue butterfly (01). Because the species is dependent on host plants whose distribution is patchy and changes over time, enough area must be available to provide for the small disturbances and successive stabilization that are an integral part of natural sand dune processes (01). The iceplant and Holland dune grass disrupt natural succession and tend to out-compete native species; thus reducing habitat and available food plants for the butterfly (01).

The species is also found in sites not associated with sand dunes (i.e., cliff/chaparral) (21). The host plant, *Eriogonum parvifolium*, grows on the steep slopes of coastal cliffs in the Big Sur region, somewhat inland in the chaparral and woodland of Vasquez Knob, and in road cuts along Cone Peak Road (22). Colonies in these areas are subject to slope failure or slumping in unseasonably wet years, road maintenance and rebuilding activities, and fire suppression activities, resulting in the decline of suitable habitat for the butterfly.

Unseasonably cool or warm weather can have an adverse effect on breeding.

Two colonies of what was thought to be Smith's blue butterfly were discovered (June 1983) in Zagante Sand Hills (inland dune parkland), Santa Cruz County, and near Crystal Spring Reservoir (serpentine grassland), San Mateo County, CA (01). Further review of the Santa Cruz and San Mateo County specimens has resulted in these colonies being given an intergrade status, representing a blend between *Euphilotes enoptes smithi* and *E.e. tildeni* (Tilden's blue butterfly) (25).

APPROVED PLAN:

U.S. Fish and Wildlife Service. 1984. Smith's Blue Butterfly Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 87 pp.

The primary objective of the Smith's blue butterfly Recovery Plan is to prevent extinction of the species. It could be reclassified from Endangered to Threatened when colonies at 10 identified sites have been secured; that is, when viable self-sustaining populations have been maintained at each site for five years. It may be considered for delisting when colonies at 18 (the 10 sites noted above plus 8 more) have been secured through

transplanting wild individuals. Viable self-sustaining populations must have been maintained for 10 consecutive years at all 18 sites.

In order to meet the recovery objective, the following activities

Management Practices - 2

(DRAFT) - Management Practices
Species BUTTERFLY, BLUE, SMITH'S
Species Id ESIS501004
Date 13 MAR 96

must be accomplished:

1) Enforcement of existing laws and regulations, including implementation of applicable policies and monitoring of Section 7 (ESA) consultations and land use plans.

2) Management, protection, and securing of the 10 sites (colonies) is required for reclassifying. Development and implementation of management plans must include; a) controlling human activities or limiting access, b) controlling off-road vehicles, c) revegetating blow areas, d) removal of exotic plants, and e) identifying colonies and sites for rehabilitation or maintenance.

3) Management, protection, and securing of the 8 sites (colonies) is required for delisting. Development and implementation of management plans must include; a) controlling human activities or limiting access, b) controlling off-road vehicles, c) revegetating blow areas, d) removal of exotic plants, e) identify essential habitat, f) rehabilitate or restore habitats, and g) possibly prescribed burns.

4) Determination of the ecological needs and taxonomic needs and the application of the results.

5) Determination of population status, identification of threats to habitat, and determination of priorities for securing habitats.

6) Formulating a management plan for implementation of restoration of native vegetation.

7) Development and implementation of information and education programs.

Though not specifically stated in the Recovery Plan, transplanting of wild individuals to suitable habitats may be necessary. Fort Ord Army Base maintains a preserve for the butterfly's protection on which the Youth Conservation Corps had removed exotics and attempts have been made to reestablish native vegetation. Improved ORV controls have begun on Marina State Beach. Development of local coastal plans have begun and law enforcement patrols are maintained on some Federal, State, and local areas.

References

***** REFERENCES FOR ALL NARRATIVES EXCEPT N-OCCURRENCE *****

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- 01 U.S. Fish and Wildlife Service. 1984. Smith's Blue Butterfly Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 87 pp.
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