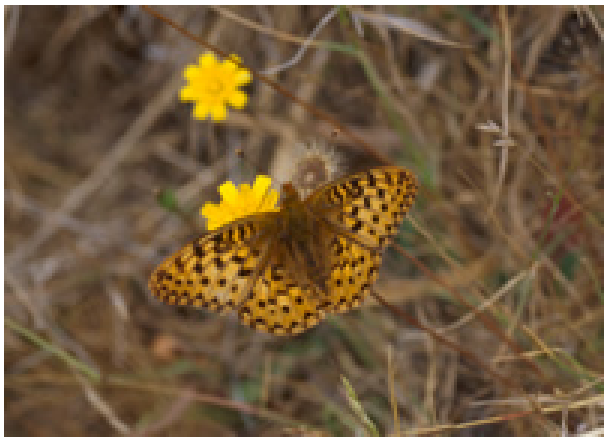
Behrens' Silverspot Butterfly
(*Speyeria zerene behrensii*)

5-Year Review:
Summary and Evaluation



U.S. Fish and Wildlife Service
Arcata Fish and Wildlife Office
Arcata, California

March 2008

5-YEAR REVIEW
Behrens' Silverspot Butterfly (*Speyeria zerene behrensii)*

1. GENERAL INFORMATION

1.1. Reviewers

Lead Region – Region 8, California and Nevada; Diane Elam and Jenness McBride (916) 414-6464

Lead Field Office – Arcata Fish and Wildlife Office; Jim Watkins (707) 822-7201

1.2. Methodology used to complete the review:

This review was conducted by Jim Watkins, Fish and Wildlife Biologist, with the Arcata Field Office of the U.S. Fish and Wildlife Service (Service), based on all information contained in files at that office. No information was provided by the public in response to the Federal Register Notice.

1.3. Background:

1.3.1. FR Notice citation announcing initiation of this review:

The FR notice initiating this review was published on March 22, 2006 (71 FR 14538). This notice opened a 60-day request for information period, which closed on May 22, 2006. A second FR notice was published on April 3, 2006 (71 FR 16584), which corrected an error in a mailing address provided in the March notice.

1.3.2. Listing history

Original Listing
FR notice: 62 FR 64306
Date listed: December 5, 1997
Entity listed: Species - Behrens' Silverspot Butterfly (*Speyeria zerene behrensii*)
Classification: Endangered

1.3.3. Associated rulemakings

No associated rulemakings have been completed for this species.

1.3.4. Review History

No status reviews have been conducted since the listing in 1997.

1.3.5. Species' Recovery Priority Number at start of 5-year review

The recovery priority is 3C, based on a ranking system ranging from 1 (highest priority) to 18 (lowest priority). The priority is based on its being a subspecies (rather than a full species) with a high degree of threat, a high potential for recovery, and existing conflict between the species' conservation and development (residential and agricultural).

1.3.6. Recovery Plan or Outline

Draft Recovery Plan for Behrens' Silverspot Butterfly (*Speyeria zerene behrensii*), November 2003
Noticed January 20, 2004 (69 FR 2725)

2. REVIEW ANALYSIS

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

2.1.1. Is the species under review a vertebrate?

No. The Endangered Species 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 butterfly 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?

No. The draft recovery plan (USFWS 2003) has not been finalized and approved. The draft recovery plan contained downlisting and delisting criteria; however, they were not threats-based criteria based on the five listing factors (A, present or threatened destruction, modification, or curtailment of its habitat or range; B, overutilization for commercial, recreational, scientific, or educational purposes; C disease or predation; D, inadequacy of existing regulator mechanisms; and E, other natural or manmade factors affecting its continued existence). The recovery criteria in the draft plan are:

<u>Downlisting Criteria</u>

a) Three metapopulations in Mendocino County and one metapopulation in Sonoma County have been established (discovered or reintroduced) at protected sites. This criterion addresses threat factor A; it has not been met.

b) All metapopulations are protected in perpetuity. This criterion addresses threat factors A, B, and D; it has not been met.

c) Adequate funding for management of all sites is assured and adaptive management plans have been developed and are being implemented. This criterion addresses threat factor A and E; it has not been met.

d) Annual monitoring has shown that the range-wide population cumulatively supports a minimum of 8,000 adults for 10 consecutive years, with no individual protected metapopulation having fewer than 500 adults in any year and no recent (within 3 years) severe (10 percent or greater) declines. This criterion applies to all of the threat factors; it has not been met.

Delisting Criteria

a) Metapopulations have been established at six protected locations: two in Sonoma County and four in Mendocino County.

b) The six protected metapopulations are managed in perpetuity for the Behrens' silverspot butterfly through the active implementation of management plans.

c) Each of the six protected metapopulations supports a minimum viable population of 500 butterflies for at least 10 years, with a range-wide total population of at least 9,000 butterflies during the same period.

2.3. Updated Information and Current Species Status

2.3.1. Biology and Habitat

Taxonomy – William H. Edwards described the Behrens' silverspot butterfly in 1869 based on an adult male collected by an unknown lepidopterist in Mendocino, California (Edwards 1869; dos Passos and Grey 1945). It is a medium-sized butterfly with a wingspan of approximately 5.5 cm (2.2 inches). The upper surfaces are golden brown with numerous black spots and lines. Wing undersides are brown, orange-brown, and tan with black lines and distinctive silver and black spots. Basal areas of the wings and body are densely pubescent.

Thirteen species of true fritillary, or silverspot butterflies, occur in North America. The genus *Speyeria* encompasses a complex group of ten fritillary species. Within *Speyeria zerene*, subspecies are clustered into five major groups that are genetically distinct but not genetically isolated, and some interbreeding likely occurs. The Behrens' silverspot butterfly is one of eight subspecies in the *bremnerii* group, which occurs in the Pacific northwest west of the Cascade Range and on the California Coast (USFWS 2003).

The Behrens' silverspot butterfly is similar in appearance to two other subspecies of *Speyeria zerene* (Howe 1975; Hammond 1980; McCorkle and Hammond 1988). The Oregon silverspot butterfly (*S. z. hippolyta*), federally listed as threatened, has a coastal distribution to the north of *S. z. behrensii*, from Lake Earl in California to Long Beach, Washington (USFWS 2001). The Myrtle's silverspot butterfly (*S. z. myrtleae*), federally listed as endangered, occupies the southernmost range of all the coastal Zerene silverspot butterflies, occurring historically from coastal San Mateo County north to coastal Sonoma County, near Jenner, California (USFWS 1992, 1998). The Behrens' silverspot

differs from the Oregon silverspot butterfly primarily by its darker basal suffusion on the upper sides of the wings and its relative larger size. The Myrtle's silverspot is larger in size and lighter in color than the Behrens' silverspot (USFWS 2003; Emmel and Emmel 1998).

The historical range of Behrens' silverspot butterfly is based on six known locations which extended from near the City of Mendocino, Mendocino County, south to the area of Salt Point State Park, Sonoma County (USFWS 2003). The six locations, from north to south, are: 1) Mendocino headlands (the type location), 2) Point Arena, 3) south Anchor Bay headlands, 4) Sea Ranch, 5) Stewarts Point, and 6) north of Salt Point. The taxonomic status of specimens collected south of Salt Point is unclear. Butterflies intermediate in appearance between the Behrens' subspecies and subspecies occurring to the south have been observed near Jenner and south of Stewarts Point, including the Fort Ross area. Launer et al. (1992) considered the subspecies near Jenner as most closely related to the Myrtle's silverspot (*S. z. myrtleae*). Subsequently, Emmel and Emmel (1998) considered the "Myrtle's" populations in coastal Marin and southern coastal Sonoma counties to differ sufficiently from Myrtle's specimens from San Mateo County to be a distinct, new subspecies, *Speyeria zerene puntareyes*. Although the Jenner population is likely more closely aligned with the "*S. z. puntareyes*" silverspot populations (formally believed to be *S. z. myrtleae*), it has also been considered similar to the Behrens' silverspot butterfly (Launer *et al.* 1992).

Some taxonomists believe the region from Stewarts Point to Jenner represents an intermediate zone where the *S. z. puntareyes* and *S. z. behrensii* subspecies overlap (R. Arnold, personal communication 2002). Additionally, some older records from the 1930s, 1940s, and into the 1970s indicate that *S. z. behrensii* may have extended as far north as Orick, Humboldt County, California. However, the Humboldt County records are most likely *S. z. gloriosa*, representing individuals from a population that exhibits a range of phenotypic variation overlapping with *S. z. behrensii*.

As indicated by the discussion above, geographic variation and the taxonomy of the *Speyeria zerene* subspecies is complex. Taxonomic decisions to date have been based on morphological features, and additional analysis, including genetic analysis, could lead to a better understanding of the differences and geographic boundaries of the subspecies of the *Speyeria zerene* complex.

Biology – There is scant published information for the Behrens' silverspot butterfly. Thus, the best available information on life history of the Behrens' silverspot comes from studies of another taxonomically-close coastal subspecies, the Oregon silverspot butterfly (*S. z. hippolyta*). This information is summarized in the draft recovery plan for the Behrens' silverspot butterfly (USFWS 2003), and in the recovery plans for the other two subspecies (USFWS 1998, 2001). Studies of the Oregon silverspot found that females lay their eggs in the debris and dried stems of the larval food plant, the early blue violet (*Viola adunca*) (McCorkle 1980; McCorkle and Hammond 1988). Other violets (*Viola* spp.) may be used as well, although Arnold (2006) suggested that *Viola adunca* is the sole larval food plant for the Behrens' silverspot. Arnold based this conclusion on a

review of botanical literature, herbarium records, a habitat assessment, and his observation of only this violet species at historical and all currently known Behrens' sites. *Viola adunca* is a small, native, perennial herb with pale to deep violet flowers, which typically blooms in late spring to early summer. Leaves generally die back to the perennial rhizome during winter, re-sprouting in the early spring. Early blue violets have a widespread distribution in western North America, but within the Behrens' silverspot range this violet species is associated with coastal grasslands (Holland, 1986; Sawyer, et al. 1995).

Life history stages of the Behrens' silverspot butterfly are described in the draft recovery plan (USFWS 2003) and summarized here. Upon hatching, the caterpillars (i.e., larvae) wander a short distance and spin a silk pad upon which they pass the fall and winter in diapause (i.e., physical dormancy). Prior to their pre-diapause movement, the newly hatched first-instar larvae eat the lining of the eggshell. The larvae are dark-colored with many branching, sharp spines on their backs. Upon termination of diapause in the spring, the larvae immediately seek out the violet food plant. During the spring and early summer, they pass through six instars (stages of development) before forming a pupa within a chamber of leaves that they draw together with silk. The adults emerge in about two weeks and live for approximately three weeks. Depending upon environmental conditions, the flight period of this single-brooded butterfly ranges from about July to August or early September. Adult males patrol open areas in search of newly emerged females. The flight period for the Behrens' silverspot butterfly is generally earlier in the year (mid to late summer) than it is for the Oregon silverspot butterfly (late summer to early fall), and larval development appears to be faster in the Behrens' subspecies. Both the earlier flight period and increased larval development rate in the Behrens' silverspot may be a response to generally warmer temperatures at southerly latitudes.

Observations of nectaring by adult Behrens' silverspot butterflies are scant, but species used include thistles (*Cirsium* spp), false dandelion (*Hypochaeris radicata*), gumplant (*Grindelia stricta*), and reportedly lupines (*Lupinus* spp). There is more known about nectar sources for two other closely-related coastal subspecies, the Oregon and Myrtle silverspot butterflies (USFWS 1998, 2001, 2003; G. Falxa, USFWS, pers. observation, 2006), and it is reasonable to assume that these would also be used by the Behrens' subspecies, when available. Nectar plants most frequently used include: members of the Asteraceae, including goldenrods (*Solidago* spp.), tansy ragwort (*Senecio jacobaea*), California aster (*Aster chilensis*), pearly everlasting (*Anaphalis margaritacea*), thistles (*Cirsium* spp, including *C. vulgare* and *C. arvense*), gumplant (*Grindelia* sp), seaside daisy (*Erigeron glaucus*), mule-ears (*Wyethia* sp.), and yarrow (*Achillea millefolium*). Reported nectar species from other plant families include: yellow sand verbena (*Abronia latifolia*), sea-pink (*Armeria maritima*) and western pennyroyal (*Monardella undulata*). Species used less frequently by Oregon silverspots include coyote bush (*Baccharis pilularis*), woolly sunflower (*Eriophyllum lanatum*), smooth hawksbeard (*Crepis capillaris*), and false dandelion (USFWS 1998, 2001, 2003; G. Falxa, USFWS, pers. observation, 2006).

Behrens' silverspot butterfly flight behavior is moderately erratic and swift in windy places, 0.3 to 1.8 meters (2 to 6 feet) above ground surface. During calm periods, flight is sometimes gentle and relaxed, especially when fog is present (Ebner, personal observation. 1998). Males appear to stay within several hundred feet of places where females occur. Flights usually occur by late morning when temperatures are above 16 degrees Celsius (60 degrees Fahrenheit), with males becoming skittish at 21 to 27 degrees Celsius (70 or 80 degrees Fahrenheit). Newly emerged males pause much less frequently than older males and females, and seem to remain on wing for longer periods of time (Ebner, personal observation. 1998). Newly emerged males can be difficult to approach. Adults may feed on nectar as long as 5 minutes, returning to the same plant repeatedly. Butterflies may rest on bare ground, in grasses, or on ferns [bracken] and other foliage. They almost always extended their wings horizontally during periods of rest, but may close them tightly after feeding and when basking (Ebner, personal observation. 1998).

Female butterflies have generally been thought to oviposit on early blue violets (*Viola adunca*) during the July to August flight period (Ebner, J. 1998 pers. obser). However, recent observations indicate that adult butterflies are in flight as early as late June (Arnold 2006). One peer-reviewer to the draft recovery plan (*in litt*. Rutowski, 2004) suggests that warmer average temperatures associated with climate change may result in extended flight periods, and may trigger a shift in the Behrens' range to the north.

Habitat – The Behrens' silverspot butterfly inhabits coastal terrace prairie habitat west of the Coast Range in southern Mendocino and northern Sonoma Counties, California. This habitat is strongly influenced by proximity to the ocean, with mild temperatures, moderate to high rainfall, and persistent fog. An occupied or potential site must have two key resources: 1) caterpillar host plants; and 2) adult nectar sources, as well as other suitable environmental conditions. Distribution of the Behrens' silverspot butterfly is highly dependant on these resources (USFWS 1997). Depending on the patchiness and spatial distribution of suitable habitat, a location may have a single butterfly population or several subpopulations that function as a metapopulation. In this context, a metapopulation is a group of populations existing at a spatial scale where individuals can occasionally disperse among different populations or patches, but these movements are not frequent because habitat patches are separated by substantial expanses of unsuitable habitat; patches may go extinct and be recolonized by migrants from other populations within the metapopulation (e.g., Harrison et al 1988).

Holland (1986) describes coastal terrace prairie as dense, tall grassland (to 1 meter or 3.3 feet tall) dominated by both sod- and tussock-forming perennial grasses. Soils are sandy loams on marine terraces below 213.5 to 305 meters (700 to 1000 feet) and within the zone of coastal fog. Vegetation is typically quite patchy and variable in composition, reflecting local differences in available soil moisture capacity. Plant species associated with coastal terrace prairie include: alta fescue (*Festuca arundinacea*), blackberry (*Rubus vitifolius*), bracken (*Pteridium aquilinum*), coast mugwort (*Artemisia suksdorfii*), coyote brush (*Baccharis pilularis*), red alder (*Alnus rubra*), salal (*Gaultheria shallon*), tufted hairgrass (*Deschampsia cespitosa*), and yellow bush lupine (*Lupinus arboreus*) (Sawyer and Keeler-Wolf 1995). Within the coastal terrace prairie, violets (*Viola* spp.)

need to be a component of the vegetative composition of the site, as they are the butterfly's larval host plant. Nectar sources need to be available to foraging adults during the summer flight period. Behrens' silverspot butterflies were observed foraging on thistles (*Cirsium* sp.) at the extant Point Arena location (Ebner, personal observation. 1998). Violets occur in relatively isolated patches at the Point Arena location, possibly a result of soil moisture and cattle grazing (J. Watkins, personal observation. 2002). Additionally, the Behrens' silverspot butterfly likely also inhabits coastal sand dune habitat based on observations of the closely related *S. z. myrtleae* and *S. z. hippolyta* subspecies that inhabit similar habitats to both the south and north, respectively, of the Behrens' range (Arnold 2006).

In addition to availability of violets and nectar plants, a third habitat characteristic, cover in the form of shelter from wind, may also affect habitat suitability. The coastal prairies within the species' range are frequently windy during the butterfly flight season, with most strong winds from the northwest. Trees and large shrubs, as well as topographic features, can provide sheltered pockets where microclimates are more favorable to butterfly flight and essential activities during windy periods. Shelter from coastal winds has been identified as important for coastal silverspot butterflies, including the Myrtle's (USFWS 1998), Oregon (USFWS 2001), and Behrens' (Arnold 2006), but data is lacking on how the amount and configuration of shelter affect habitat quality.

Distribution and Abundance – Surveys conducted during the 2005 and 2006 flight periods indicate that the range of the Behrens' silverspot butterfly persists in the Point Arena area in Mendocino County, which likely supports the largest metapopulation (Pratt 2004; Arnold 2006). Butterflies at Manchester State Park may be part of the Point Arena metapopulation (Arnold 2006). Other metapopulations occur at Stewart's Point and Salt Point State Park, both located in Sonoma County. These sites were occupied at listing (USFWS 1997). Although individual butterflies were observed at these locations, the size and viability of each metapopulation is unknown (Arnold 2006). Transects need to be established to determine metapopulation and range-wide population trends. Transects designed to address these questions have been established at Point Arena and Manchester State Park in 2006 as a result of cooperative efforts from staff at California State Parks, Bureau of Land Management, and the Arcata Fish and Wildlife Office. Several years' data are needed to determine population trends.

2.3.2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1. Factor A, Present or threatened destruction, modification or curtailment of its habitat or range:

Development pressures have increased in northern Sonoma and Mendocino Counties, California, since listing, and disturbance regimes (such as wildfire) that maintain butterfly habitat continue to be suppressed (62 FR 64306). Habitat disturbance reduces the effects of succession, and to some degree, the effects resulting from the spread of nonnative vegetation. Housing developments, such as Sea Ranch in

Sonoma County, not only remove habitat for buildings and supportive infrastructure, but also require fire suppression and pre-suppression actions to protect property. Consequently, shore pine (*Pinus contorta*) and nonnative vegetation are able to get a foothold in butterfly habitat, and expand, further reducing the open space required by the butterflies and their host plants (Hammond 1994, Sawyer and Keeler-Wolf 1995).

The historical Point Arena site has been partially protected by purchase and associated Federal management. The U.S. Bureau of Land Management (BLM) has been identified as the best manager, and does so in a multiple-use context. Several State and Federal agencies contributed towards purchase of the ranch with the largest contribution coming from the California Coastal Conservancy. Due to BLM being the primary manager, Federal actions on the property are subject to Section 7 consultation (refer to section 2.3.2.4). At purchase, an agricultural easement was provided the seller allowing continued grazing at historical levels. As a consequence, cattle grazing continues on much of the Point Arena site.

The listing and draft recovery plan state that agriculture and its associated pesticide use have reduced the amount and quality of remaining silverspot butterfly habitat (62 FR 64306; USFWS 2003). Residential and agricultural development result in habitat loss and fragmentation; mortalities and injuries are associated with vehicle traffic; and habitat succession further reduces the amount and quality of remaining habitat. Suppression of wildfire allows succession to progress, with trees and shrubs encroaching on coastal prairies. Nonnative vegetation also encroaches on silverspot butterfly habitat, making butterfly access difficult to the larval host plants and nectar plants needed for ovipositing and adult feeding, respectively. Livestock grazing likely serves to reduce the effects of succession and nonnative vegetation by decreasing thatch and vegetation density. Overgrazing could result in erosion, especially on slopes, and remove the larval host plant, early blue violet. Studies need to be designed and implemented to determine the extent that habitat threats limit Behrens' silverspot butterfly distribution and overall abundance (USFWS 2003). The Arcata Fish and Wildlife Office provides technical assistance to Federal, State, and County governments regarding proposed projects that have the potential to affect the Behrens' silverspot butterfly. We anticipate that cooperative management will reduce the potential negative affects from agricultural and urban development, and other land management actions that could reduce or remove the suitability of butterfly habitat.

2.3.2.2. Factor B, Overutilization for commercial, recreational, scientific, or educational purposes:

Butterfly collection continues to be a concern, as it was when the species was listed (62 FR 64306). We believe that the Behrens' silverspot is particularly vulnerable to the collection trade because of its endangered status, limited distribution, and presumed small population size. Although the extent of collection is unknown, it is our intent to not enable illegal collection. As a result, we have declined to designate critical habitat for the subspecies, and have refrained from identifying specific butterfly locations in the draft recovery plan. Research activities that may result in

take of butterflies are managed under the Service's 10(a)(1)(A) recovery permit program. However, no permits have currently been issued for the Behrens'.

2.3.2.3. Factor C, Disease or predation:

Disease or predation was not identified as a threat in the original listing (62 FR 64306). We do not know what effect, if any, disease and predation may have on the Behrens' silverspot butterfly's range-wide population, or on isolated metapopulations. Birds and other predators likely consume individual butterflies on an opportunistic basis; however, because silverspot butterfly populations appear to be low, it is difficult to determine if predation is limiting range-wide or site-specific metapopulations.

2.3.2.4. Factor D, Inadequacy of existing regulatory mechanisms:

There has been no change in the imminence of this threat factor since listing. The original listing rule (62 FR 64306) did not address regulatory mechanisms. The California Environmental Quality Act (CEQA) (chapter 2, section 21050 *et seq.* of the California Public Resources Code) affords limited protection for the species under state law, due to its status as a federally endangered species. The California Coastal Act of 1976 (Division 20, section 30000 *et seq*.) applies when habitat is located in the coastal zone. Projects within the coastal zone are reviewed by either the California Coastal Commission or local government by virtue of their Local Coastal Plan, when a project occurs within their jurisdiction. Commission review or compliance with approved Coastal Plans ensure that protective provisions of the Coastal Zone Management Act are considered when impacts to coastal resources, such as the butterfly, may be affected by project implementation. However, the Coastal Zone Management and the California Coastal Acts do not address the injury or death of butterflies, and only reduce loss or degradation of habitat. These Acts do not necessarily prevent a net loss of habitat or loss if individual butterflies.

The Bureau of Land Management (BLM) now manages the Stornetta Ranch (a large portion of the site known as the Point Arena metapopulation) under an interim plan that allows for resource conservation, limited recreational access (primarily hiking and equestrian), and cattle grazing. Continued cattle grazing was conditioned as part of the ranch's acquisition (BLM 2006). BLM's management is subject to section 7 review under the Endangered Species Act, and public review under the National Environmental Policy Act. Butterflies and habitat on non-Federal lands are subject to provisions in section 10 of the Endangered Species Act, and the California Environmental Quality Act (state law).

2.3.2.5. Factor E, Other Natural or manmade factors affecting its continued existence:

The original listing rule (62 FR 64306) did not address other natural or manmade factors. Collision with vehicles (road-kill) is identified as a threat for the closely-

related Oregon silverspot butterfly (USFWS 2001). The magnitude of road-kill as a threat to the Behrens' silverspot is not documented, but road-kill is a potential threat due to the proximity of occupied habitat to Highway 1 and other well-traveled public roads. We believe that any such threat has likely increased since listing, due to increased development and traffic within the historical range.

2.4. Synthesis

We have no new information to suggest that threats to the species have substantially changed since the time of listing. The primary threats continue to be potential destruction and modification of habitat. The Stornetta Ranch has been purchased and placed in public ownership since listing. Proposed projects through BLM's management (e.g., cattle grazing) may result in incidental take of butterflies. Other lands have not been protected since the time of the listing, and currently none of the known occupied sites are being managed specifically for Behrens' silverspot butterfly conservation.

Service-funded surveys conducted in 2004 (Pratt 2004), 2005, and 2006 (Arnold 2006) have located individual butterflies in historical habitat; however, the extent and viability of those populations remain unknown. Extant metapopulations remain at historical sites located at Salt Point, Stewart's Point, and Point Arena/Manchester, which were in place at the time of listing. Further, more intensive surveys will need to be conducted to determine if other sites exist within the subspecies' range (Arnold 2006).

Based on the information presented in this review, we find that the Behrens' silverspot butterfly continues to meet the definition of endangered. We do not recommend change in the species' status change at this time.

3. RESULTS

3.1. 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

_X__ No change is needed

3.2. New Recovery Priority Number

3C (no change)

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

Recovery criteria for the Behrens' silverspot butterfly contain specific goals with respect to the number of individuals. Therefore, surveys are needed to:

1. determine the size of the range-wide population and site-specific metapopulations; and
2. locate metapopulations.

Landowners/managers should be contacted to initiate conservation planning and implement recovery actions. Planning will stress management actions that increase or sustain butterfly populations, and remove threats that may limit population expansion or recovery.

Disease affiliated with the Behrens' silverspot and its habitat will need to be investigated if monitoring indicates there is a downward population trend, and no other obvious cause for the decrease can be identified. Additionally, disease-related investigations would be initiated if disease issues are identified in the closely related Myrtle's or Oregon silverspot subspecies, or other Behrens' conspecifics. These issues need to be addressed in the final recovery plan.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Behrens' Silverspot Butterfly (*Speyeria zerene behrensii*)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened

____ Uplist to Endangered

____ Delist

__X_ No change needed

Review Conducted By: _____
Jim Watkins, Fish and Wildlife Biologist

FIELD OFFICE APPROVAL:
Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date _____

REGIONAL OFFICE APPROVAL:
Lead Regional Director, Fish and Wildlife Service

Approve _____ Date _____

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Review Conducted By: Arcata Fish and Wildlife Office
Jim Watkins, Fish and Wildlife Biologist

FIELD OFFICE APPROVAL:
Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date 3/26/08

REGIONAL OFFICE APPROVAL:
Lead Regional Director, Fish and Wildlife Service

Approve _____ Date 3/31/08