

*Physaria (Lesquerella) kingii* subsp. *bernardina*  
**(San Bernardino Mountains Bladderpod)**

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



Photo courtesy of Scott Eliason

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

**August 13, 2009**

## 5-YEAR REVIEW

*Physaria (Lesquerella) kingii* subsp. *bernardina* (San Bernardino Mountains bladderpod)

### I. GENERAL INFORMATION

#### **Purpose of 5-Year Reviews:**

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), to conduct a review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species (delisted), be changed in status from endangered to threatened (downlisted), or be changed in status from threatened to endangered (uplisted). Our original listing of a species as endangered or threatened is based on the existence of threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act, and we must consider these same five factors in any subsequent consideration of reclassification or delisting of a species. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process defined in the Act that includes public review and comment.

#### **Species Overview:**

*Physaria (Lesquerella) kingii* subsp. *bernardina* (San Bernardino Mountains bladderpod) is a silvery, short-lived perennial member of the (Brassicaceae) mustard family. The plants are typically found within singleleaf pinyon-mountain juniper and white fir forest. San Bernardino Mountains bladderpod is endemic to the San Bernardino Mountains, San Bernardino County, California.

#### **Methodology Used to Complete This Review:**

This review was prepared by the Carlsbad Fish and Wildlife Office following the Region 8 guidance issued in March 2008. We used information from the draft San Bernardino Mountains Carbonate Endemic Plants Recovery Plan (draft Recovery Plan) (USFWS 1997), and we considered available literature, office files, and discussions with researchers or land managers whose expertise includes San Bernardino Mountains bladderpod and/or its habitat. In addition, we received one letter on May 6, 2008, (J. Potter, State of California Department of Justice, *in litt.* 2008) addressing a number of species, including San Bernardino Mountains bladderpod, recommending that we explore and evaluate the potential effects of global warming. This 5-year review contains updated information on the species' biology and threats, and an assessment of that information compared to that known at the time of listing or since the last 5-year review. We focus on current threats to the species that are attributable to the Act's five listing factors. The review synthesizes all this information to evaluate the listing status of the species and provide an indication of its progress towards recovery. Finally, based on this synthesis and the

threats identified in the five-factor analysis, we recommend a prioritized list of conservation actions to be completed or initiated within the next 5 years.

**Contact Information:**

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**Federal Register (FR) Notice Citation Announcing Initiation of This Review:** A notice announcing initiation of the 5-year review of this taxon and the opening of a 60-day period to receive information from the public was published in the Federal Register on March 5, 2008 (USFWS 2008, pp. 11945–11950).

**Listing History:**

**Original Listing**

**FR Notice:** 59 FR 43652

**Date of Final Listing Rule:** August 24, 1994

**Entity Listed:** *Lesquerella kingii* ssp. *bernardina* (San Bernardino Mountains bladderpod), a plant subspecies. The current name is *Physaria kingii* subsp. *bernardina*; see Changes in Taxonomic Classification or Nomenclature, below.

**Classification:** Endangered

**Associated Rulemakings:**

**Critical Habitat**

**FR Notice:** 67 FR 78569

**Date of Final Critical Habitat Designation:** December 12, 2002

**Review History:** No 5-year reviews have previously been conducted for this species.

**Species' Recovery Priority Number at Start of 5-Year Review:** The recovery priority number for San Bernardino Mountains bladderpod is 9 according to the Service's 2008 Recovery Data Call for the Carlsbad Fish and Wildlife Office, based on a 1 to 18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (Endangered and Threatened Species Listing and Recovery Priority Guidelines, 48 FR 43098, September 21, 1983). This number indicates that the subspecies has a moderate degree of threat and a high potential for recovery.

**Recovery Plan or Outline:**

**Name of Plan or Outline:** San Bernardino Mountains Carbonate Endemic Plants Recovery Plan (draft)

**Date Issued:** September 1997

## II. REVIEW ANALYSIS

### Application of the 1996 Distinct Population Segment (DPS) Policy

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

### Information on the Species and its Status

#### Species Biology and Life History

San Bernardino Mountains bladderpod is a silvery, short-lived perennial in the Brassicaceae (mustard family), reaching 2 to 6 inches (5 to 15 centimeters) in height. The leaves are wavy-margined to shallow-toothed. The outer basal leaves are diamond-shaped to round, and the inner leaves are elliptic with petioles 0.8 to 2 inches (2 to 5 centimeters) long. Flowers are borne in terminal racemes and bloom from May to June. The petals are yellow and 0.2 to 0.5 inches (5.5 to 13 millimeters) long, and styles are 0.12 to 0.16 inches (3 to 4 millimeters) long. The fruits are spherical, pubescent, two-chambered, and contain 2 to 4 seeds per chamber (Rollins 1993, p. 430).

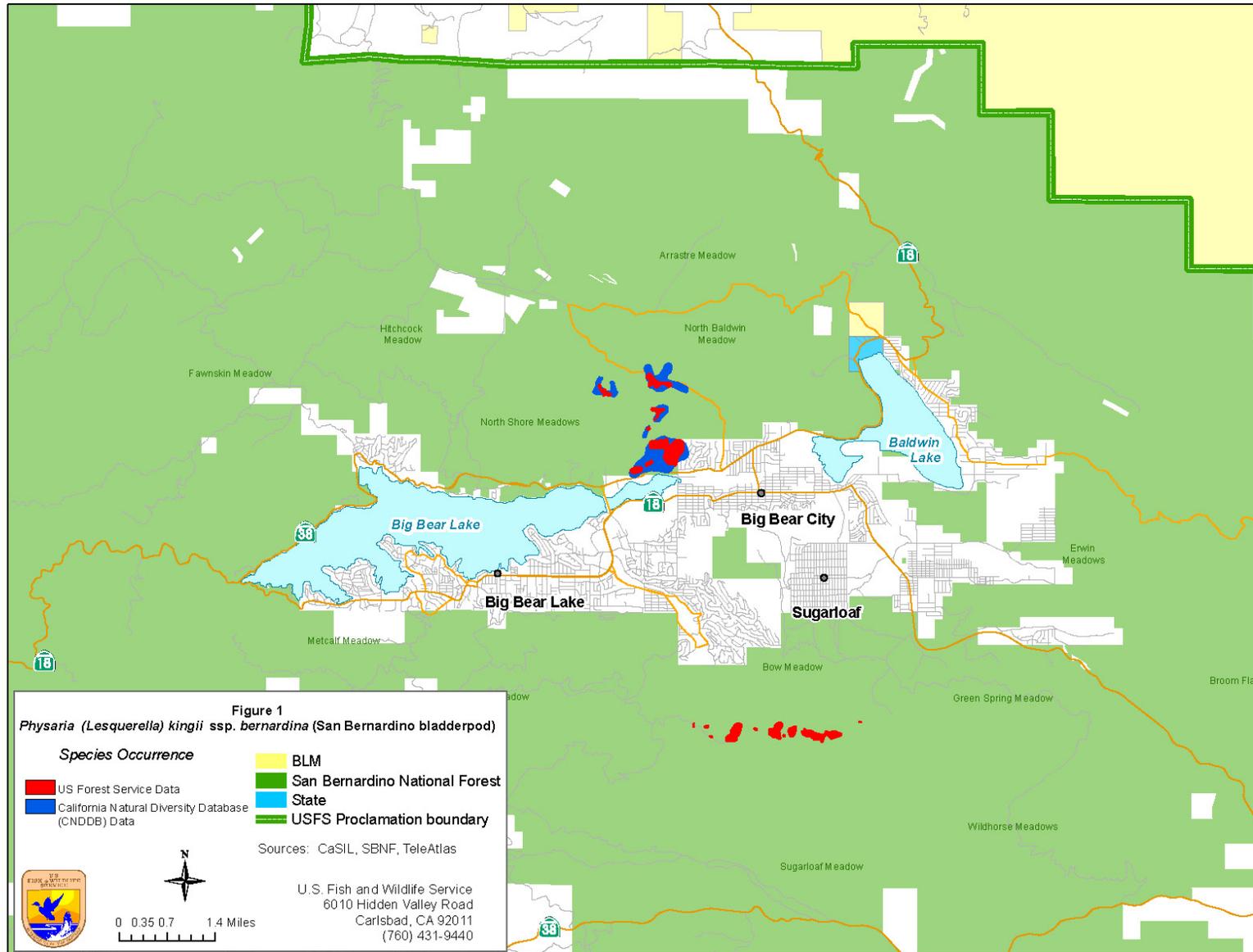
#### Spatial Distribution

At the time of listing, San Bernardino Mountains bladderpod was known from two areas on either side of Bear Valley (USFWS 1994, p. 43654). One cluster of occurrences is on the north side of Bear Valley towards the east end of Bertha Ridge. The other cluster is on the north-facing slope of Sugarlump Ridge to the south of the valley (USFWS 1994, p. 43654).

Since listing, there have been no significant changes in the known range of the taxon. Recent assessments indicate that there is about 210 acres (85 hectares) of occupied habitat for San Bernardino Mountains bladderpod (USFS 2005a, p. 272) (Figure 1).

#### Abundance

The estimate of individuals in the Bertha Ridge population was 25,000 in 1980 and less than 10,000 in 1988 (CNDDDB). In 1991, the Sugarlump Ridge population contained about 10,000 individuals (USFWS 1994, p. 43654). The number of individuals at the time of listing was unknown. Since listing, the San Bernardino National Forest mapped 22 site-specific localities that support this species (USFWS 1994, p. 78572).



### Habitat or Ecosystem

San Bernardino Mountains bladderpod is typically found within single leaf pinyon-mountain juniper and white fir forest (Neel 2000, p. 162) on dolomite soils and gentle to moderate slopes (USFWS 1997, p. 9). Densities of San Bernardino Mountains bladderpod appear to be higher in white fir forest (Neel 2000, p. 130). Some plants have been found on old roads (USFWS 1997, p. 9). San Bernardino Mountains bladderpod shows little range overlap with the carbonate endemic plants in the area (Neel 2000, p. 132).

The Carbonate Habitat Management Strategy (Olson 2003) uses several terms to distinguish among types of habitat for the carbonate plant species: *occupied habitat* is habitat currently known to be occupied by one or more species of carbonate plants based on field survey information; *critical habitat* is federally designated pursuant to the Act and may be occupied or unoccupied (see below); and *suitable habitat* has been defined by the San Bernardino National Forest based upon a combination of plant associations, carbonate substrate, and soils derived from carbonate substrate (Redar and Eliason 2001). Suitable habitat is not currently known to be occupied; however, in some areas it does overlap with unoccupied critical habitat.

There are two units of critical habitats designated for San Bernardino Mountains bladderpod (the Bertha Ridge unit on the north side of Bear Valley and the Sugarlump Ridge unit to the south side of the valley). These units total 1,025 acres (415 hectares) (USFWS 2002, pp. 785780 and 78581). Of these, 1,005 acres (407 hectares) are on the San Bernardino National Forest while 20 acres (8 hectares) are on private land (USFWS 2002, p. 78581). The Bertha Ridge and Sugarlump Ridge units are essential to San Bernardino Mountains bladderpod because they provide suitable carbonate substrates and carbonate derived soils with intact natural surfaces, associated plant communities, and important core occurrences (USFWS 2002, pp. 78580 and 78581).

The primary constituent elements of San Bernardino Mountains bladderpod designated critical habitat include: 1) soils derived primarily from Bonanza King Formation and Undivided Cambrian parent materials that occur on hillsides or on large rock outcrops at elevations between 6,883 and 8,800 feet (2,098 and 2,700 meters); 2) soils with intact, natural surfaces that have not been substantially altered by land use activities (e.g., graded, excavated, re-contoured, or otherwise altered by ground-disturbing equipment); and 3) associated plant communities that have areas with an open canopy cover and little accumulation of organic material (e.g., leaf litter) on the surface of the soil (USFWS 1994, p. 78577).

### Changes in Taxonomic Classification or Nomenclature

The genus *Lesquerella* is now considered united with the genus *Physaria*. Ninety-one names in *Lesquerella* have been transferred to *Physaria* based on molecular, morphological, distributional, and ecological data (Al-Shehbaz and O’Kane 2002, p. 319).

Since listing, molecular, morphological, distributional, and ecological data clearly show that *Physaria* is nested within *Lesquerella* (Al-Shehbaz and O’Kane 2002). Most of the recognized taxa formerly considered under *Lesquerella* are assigned new nomenclatural combinations under *Physaria* by Al-Shehbaz and O’Kane (2002). The name now recognized for San Bernardino

Mountains bladderpod is *Physaria kingii* (S. Watson) O’Kane & Al-Shehbaz subsp. *bernardina* (Munz) O’Kane and Al-Shehbaz (Al-Shehbaz and O’Kane 2002, p. 319). This systematic treatment will be followed by Dr. Al-Shehbaz in his upcoming contribution to the revision of the Jepson Manual Higher Plants of California and by Dr. O’Kane in his upcoming contribution to the Flora of North America (Al-Shehbaz, Missouri Botanical Garden, pers. comm. to G. Wallace CFWO, 2006). The name change in no way changes the description or range of the taxon or its relationship to other subspecific taxa of *Physaria kingii*. The common name for the taxon remains the same.

### Genetics

There is no updated genetics information available beyond that described above under “Changes in Taxonomic Classification or Nomenclature”.

### Species-specific Research and/or Grant-supported Activities

We are unaware of any research and/or grant-supported activities involving this species since listing.

### **Five-Factor Analysis**

The following five-factor analysis describes and evaluates the threats attributable to one or more of the five listing factors outlined in section 4(a)(1) of the Act.

#### **FACTOR A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range**

At the time of listing, habitat destruction associated with off-highway vehicle use, urban development near Big Bear City, development of a ski run, and energy development projects were described as major threats to San Bernardino Mountains bladderpod (USFWS 1994, pp. 43659–43660). In addition, gold mining was mentioned as a threat. Although not specific to San Bernardino Mountains bladderpod, activities associated with limestone mining were considered the major threat to the carbonate endemic plant taxa included in the same listing rule (USFWS 1994, p. 43658)

Off-road (off-highway) vehicle use was identified as a threat in the final listing rule (USFWS 1994, p. 43659). Since listing, some level of impact from off-road vehicles continues to impact the species. About 2 acres (one hectare) of occupied habitat and 10 acres (4 hectares) of designated critical habitat overlap with roads and trails (USFWS 2005a, p. 273). In 1999, signs were installed within San Bernardino Mountains bladderpod habitat to inform the public of these sensitive areas and to help prevent impacts from recreational uses (USFS 2005a, p. 314). Fencing and barriers were also installed along roads to prevent off-road driving (USFS 2005a, p. 314).

The San Bernardino Mountains bladderpod populations on the east end of Bertha Ridge near Big Bear City were described in the final listing rule as being threatened by impacts associated with urban development (USFWS 1994, p. 43659). Habitat continues to be affected due to proximity with urban development through mountain biking off roads and trails, particularly in

the area north of Whispering Forest, where several trails connect U.S. Forest Service and private lands (USFS 2005a, p. 313).

An additional threat to the San Bernardino Mountains bladderpod described in the final listing rule was from the proposed addition of a downhill ski run to Sugarlump Ridge (USFWS 1994, p. 43660). On January 26, 1995, the Service issued a biological opinion for the Bear Mountain Ski Resort Expansion Project. This project involved the loss of 0.55 acres (0.22 hectares) of previously disturbed San Bernardino Mountains bladderpod habitat (USFWS 1995, p. 2). Since then, we have no new information on whether the expansion of ski facilities is likely. If so, such activity would likely continue to be a threat to this species, but would also likely be subject to consultation under section 7 of the Act (see Factor D).

Prospecting and working on gold mining claims continue to impact this species (USFS 2005a, p. 313). About 10 percent of San Bernardino Mountains bladderpod occupied habitat is under claim for gold mining (USFS 2005a, p. 313).

Fire suppression activities, not identified as a threat in the final listing rule, can result in ground disturbance and other impacts to habitat through trampling, fire line construction, retardant and water drops, establishment of fire camps, and exposure to conditions favorable to nonnative invasive plants. The U.S. Forest Service has distributed maps of San Bernardino Mountains bladderpod occurrences and provided guidance to fire-fighting personnel to avoid these areas to the extent practicable during fire suppression activities (USFWS 2001, p. 19). However, in 2003, a fuelbreak was created in San Bernardino Mountains bladderpod occupied and designated critical habitat in emergency response to the Old Fire. Bulldozers were not used to create this fuelbreak; instead, the area was hand thinned and brush piles were placed on San Bernardino Mountains bladderpod individuals. These piles were removed one month later, but the creation of the fuelbreak left an area more attractive to recreational activities (USFS 2005a, p. 314). Evidence of bicycle and motorcycle tracks was found in the area of the fuelbreak after clearing of vegetation (USFS 2005a, p. 314).

#### Summary of Factor A

In summary, the threats identified at listing still threaten San Bernardino Mountains bladderpod, except for proposed expansion of ski facilities. The current threats include urban development and associated activities, off-road vehicle use and mining. The Forest Service has implemented measures to reduce the potential effects of these threats including the placement of signs and barriers. Several additional threats such as dispersed target shooting, dispersed camping, fuelwood collection, and fire suppression activities have been identified since listing. The Forest Service has taken steps to remove the threat of dispersed target shooting, dispersed camping, and fuelwood collection and minimize the potential effects of fire suppression activities.

#### **FACTOR B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes**

The final rule listing San Bernardino Mountains bladderpod and four other plant taxa from the southern California mountains indicated that some of the taxa may become vulnerable to collecting by curiosity seekers as a result of the increased publicity following listing. However,

we have no information that overutilization or collection has been, or is currently, a threat to San Bernardino Mountains bladderpod.

**FACTOR C: Disease or Predation**

Disease is not known to be threat affecting San Bernardino Mountains bladderpod. We have no information to substantiate a threat from predation to the San Bernardino Mountains bladderpod mentioned in the final listing rule. The capsules of plants from an occurrence of San Bernardino Mountains bladderpod in Big Bear were observed to have been broken open by unknown seed predators (USFWS 1994, p. 43661). No new information is available on this issue, since listing.

**FACTOR D: Inadequacy of Existing Regulatory Mechanisms**

**State Protections**

The State’s authority to conserve rare wildlife and plants is composed of four major pieces of legislation: the California Endangered Species Act, the Native Plant Protection Act, the California Environmental Quality Act, and the Natural Community Conservation Planning (NCCP) Act.

At the time of listing, the Native Plant Protection Act (NPPA) and the California Endangered Species Act (CESA) were noted as potentially offering some protection for San Bernardino Mountains bladderpod. However, the plant is not listed under the California Endangered Species Act or the Native Plant Protection Act, nor is it addressed under any existing NCCP Plan under the NCCP Act. Thus, these State laws are not adequate regulatory mechanisms to protect this species.

The only State law providing protection to San Bernardino Mountains bladderpod is the California Environmental Quality Act (CEQA). This law requires review of any project that is undertaken, funded, or permitted by the State or a local governmental agency. If significant effects are identified, the lead agency has the option of requiring mitigation through changes in the project. San Bernardino Mountains bladderpod is on the California Native Plant Society Inventory as List 1B. Under the CEQA, impacts to List 1B plants are considered significant and must be addressed. However, under CEQA, the lead agency may decide that overriding considerations make mitigation infeasible (CEQA section 21002). Therefore, this regulatory mechanism may not be adequate to protect the species because protection of listed species through CEQA is dependent upon the discretion of the lead agency involved.

**Federal Protections**

National Environmental Policy Act (NEPA): NEPA (42 U.S.C. 4371 *et seq.*) provides some protection for listed species that may be affected by activities undertaken, authorized, or funded by Federal agencies. Prior to implementation of such projects with a Federal nexus, NEPA requires the Federal agency to analyze the project for potential impacts to the human environment, including natural resources. In cases where that analysis reveals significant environmental effects, the Federal agency must propose mitigation alternatives that would offset those effects (40 C.F.R. 1502.14(f)). These mitigations can provide some level of protection for listed species. However, NEPA does not require that environmental impacts be avoided, only

that effects be assessed and the analysis disclosed to the public. Therefore, the adequacy of this regulatory mechanism may not fully protect the species.

Endangered Species Act of 1973, as amended (Act): Since listing, the Act is the primary Federal law that may provide protection for this species. The Service's responsibilities include administering the Act, including sections 7, 9, and 10. Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out do not "jeopardize" a listed species or result in the "destruction or adverse modification" of habitat in areas designated by the Service to be "critical". Critical habitat has been designated for this taxon (USFWS 2002, pp. 78569–78610). A jeopardy determination is made for a project that is reasonably expected, either directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its reproduction, numbers, or distribution (50 C.F.R. § 402.02). A non-jeopardy opinion may include reasonable and prudent measures that minimize the amount or extent of incidental take of listed species associated with a project. Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical (50 C.F.R. § 402.02).

Under Section 9(a)(2) of the Act, with respect to endangered plant taxa, it is unlawful to remove and reduce to possession (i.e., collect) any such taxon from areas under Federal jurisdiction; maliciously damage or destroy any such taxon on any such area; or remove, cut, dig up, or damage or destroy such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.

The Service has addressed certain projects that have resulted in impacts to San Bernardino Mountains bladderpod through section 7 consultations with the U.S. Forest Service. In 2001, non-jeopardy biological opinions were issued addressing the effects of Land and Resource Management Plan program direction and activities that were occurring in San Bernardino Mountains bladderpod habitat (USFWS 2001). The primary activities occurring included mining, roads, and trails. In 2005, non-jeopardy biological and conference opinions were issued that addressed the revised Land Management Plans for the four southern California national forests (USFWS 2005a). These plans included strategic direction in the form of land use zoning and standards. The land use zoning and standards indicated that for projects under the plans: 1) ongoing activities will be neutral or beneficial to certain areas with San Bernardino Mountains bladderpod, 2) new activities will be neutral or beneficial to San Bernardino Mountains bladderpod, and 3) expansion of existing facilities or new facilities will direct recreational use away from San Bernardino Mountains bladderpod. Exceptions were included for fuel treatments in wildland-urban interface areas and to allow for projects with short-term effects and long-term benefits (USFWS 2005a, p. 15). The revised Land Management Plans for the four southern California national forests are programmatic strategies. Consequently implementation is not mandatory, so projects can still occur outside the conservation parameters of these documents.

National Forest Management Act (NFMA): The National Forest Management Act (36 C.F.R. 219.20(b)(i)) has required the U.S. Forest Service to incorporate standards and guidelines into Land and Resource Management Plans, including provisions to support and manage plant and

animal communities for diversity and for the long-term, range-wide viability of native species. Recent changes to NFMA may affect future management of listed species, particularly rare plant occurrences, on National Forests. On January 5, 2005, the Forest Service revised National Forest land management planning under NFMA (USFS 2005b, pp. 1023–1061). The new planning rule changed the nature of Land Management Plans so that plans generally would be strategic in nature and could be categorically excluded from NEPA analysis, and thus not subject to public review. Under this new planning rule, the primary means of sustaining ecological systems, including listed species, would be through guidance for ecosystem diversity. If needed, additional provisions for threatened and endangered species could be provided within the overall multiple-use objectives required by NFMA. The final rule did not include a requirement to provide for viable populations of plant and animal species, which had previously been included in both the 1982 and 2000 planning rules. On March 30, 2007, however, the United States District Court in *Citizens for Better Forestry et al. v. USDA* (N.D. Calif.) enjoined the U.S. from implementing and utilizing the 2005 rule until it complies with the court’s opinion regarding the Administrative Procedure Act, the Act, and the NEPA. On May 14, 2007, the Forest Service published a Notice of Intent to prepare an environmental impact statement to analyze and disclose potential environmental consequences associated with a National Forest System land management planning rule. On April 28, 2008, the Forest Service replaced previous National Forest System land management planning rules after completing a Final Environmental Impact Statement. However, on June 30, 2009, the United States District Court in *Citizens for Better Forestry et al. v. USDA* (N.D. Calif.) enjoined the Forest Service from implementing and utilizing the 2008 rule due to violations of NEPA and the Act. Due to the uncertainty regarding the future of regulations under the NFMA, the impact of any revisions of this rule to listed species is unknown at this time.

Carbonate Habitat Management Strategy: Since San Bernardino Mountains bladderpod was listed, the U.S. Forest Service, U.S. Fish and Wildlife Service, and Bureau of Land Management have collaborated with mining companies, major claim holders, San Bernardino County, and the California Native Plant Society to develop the Carbonate Habitat Management Strategy (Olson 2003). The goals of the Carbonate Habitat Management Strategy are: 1) to protect the listed plants and the habitat components they require; 2) to guide impact minimization and compensation for unavoidable impacts; 3) to streamline reviews of mining activities in carbonate plant habitat; 4) to guide habitat restoration; and 5) to plan and provide for long-term needs of both the mining industry and listed species conservation. One of the primary objectives of the Carbonate Habitat Management Strategy is to establish conservation areas for carbonate plants. The Carbonate Habitat Management Strategy provides parameters for allowing mining while ensuring the protection of listed carbonate plant species in perpetuity through the establishment of habitat reserves. The Service provided a programmatic non-jeopardy and no adverse modification biological opinion on May 2, 2005, for the Carbonate Habitat Management Strategy regarding potential effects to federally listed carbonate plant species except the San Bernardino Mountains bladderpod. However, the Carbonate Habitat Management Strategy does not explicitly include allowances for impacts to San Bernardino Mountains bladderpod. Most occupied and adjacent suitable habitats for this species occur on dolomite substrates, but are included in the proposed Carbonate Habitat Management Strategy reserve system. Projects can still be proposed and implemented outside the confines of the Carbonate Habitat Management Strategy (Olson 2003, p. 6).

### Summary of Factor D

In summary, while both the CEQA and NEPA may provide some discretionary conservation benefit to San Bernardino Mountains bladderpod, the Act is the primary regulatory mechanism mandating San Bernardino Mountains bladderpod conservation. With the majority of suitable and occupied habitat on U.S. Forest Service lands (Figure 1), the Act remains the primary regulatory mechanism for ensuring that San Bernardino Mountains bladderpod is addressed during planning efforts for land management actions potentially affecting this species.

### **FACTOR E: Other Natural or Manmade Factors Affecting Its Continued Existence**

Among the threats identified in the final listing rule for this species was the potential for stochastic extinction resulting from random events, and this threat still exists. A significant drop in San Bernardino Mountains bladderpod populations occurred between 1980 and 1988 and may have been due to years of drought conditions (USFWS 1994, p. 43662). Because this species is restricted to certain, limited soils, it is likely that its population has always been small. However, the population has persisted. This suggests even though the magnitude of this threat may be high, its immediacy is low. However, the potential for stochastic extinction is enhanced by habitat loss and fragmentation. Habitat fragmentation can result in areas too limited and isolated to support pollinators or other seed dispersal agents (USFWS 1997, p. 16). Global climate change may further increase likelihood of stochastic extinction as described below.

The U.S. Forest Service has taken steps to remove the threats, identified since listing, from dispersed target shooting, dispersed camping, and fuelwood collection (USFWS 2001). These activities can result in trampling of San Bernardino Mountains bladderpod. The San Bernardino National Forest has prohibited fuelwood collection and target shooting in carbonate plant habitat (USFWS 2001, pp. 20–21). Upon successful implementation of these policies, these threats should be eliminated.

Climate change was not mentioned as a potential threat in the final listing rule for San Bernardino Mountains bladderpod. This concern was raised in a letter received by the Service on May 6, 2008 (Potter, *in litt.* 2008). Current climate change predictions for terrestrial areas in the Northern Hemisphere indicate warmer air temperatures, more intense precipitation events, and increased summer continental drying (IPCC 2007; Cayan et al. 2005; Field et al. 1999). However, predictions of climatic conditions for smaller sub-regions such as California remain uncertain.

Some evidence suggests that global climate change may be a particular concern to montane species. Summary papers have cited studies documenting shifts in the distribution of various taxa in response to climatic warming trends. These shifts are often found from the southern and lower elevation ends of the species' range to the northern or higher elevation of the range (Field et al. 1999, pp. 38–39). In a local effort to document these types of shifts in range, the Deep Canyon Transect in the Santa Rosa Mountains (Riverside County) about 50 miles (80 km) southeast of the San Bernardino Mountains (San Bernardino County) was surveyed in 2006–2007. Data gathered on plant elevational distribution was compared to that from a 1977 survey (Kelly and Goulden 2008, pp. 11823–11826). For ten dominant plant taxa the elevational distribution of all but one moved up during the intervening period. The average increase in

elevational range for all taxa was 213 feet (65 meters) (Kelly and Goulden 2008, p. 11824–11825). The authors attribute the upward elevational shifts to climate change impacts and discount fire frequency and air pollution as causal agents (Kelly and Goulden 2008, p. 11825).

San Bernardino Mountains bladderpod is endemic to isolated occurrences of dolomite and limestone derived soils in the San Bernardino Mountains. Therefore, any combination of environmental conditions, such as those attributed to climate change above, that force an upward shift in the distribution of the species poses a profound threat to the taxon's persistence and recovery. If this species is affected by elevational shifts resulting from climate change, then there will be no suitable habitat when the elevational range exceeds the species' maximum elevation. As this occurs, the density and distribution may concentrate the taxon into a smaller area. This, in turn, may make the species even more susceptible to stochastic extinction. To date, no species-specific monitoring has been conducted to detect an elevational shift in its range.

### **III. RECOVERY CRITERIA**

No final recovery plan has been completed for this species. However, a draft San Bernardino Mountains Carbonate Endemic Plants Recovery Plan issued in September 1997 includes San Bernardino Mountains bladderpod (USFWS 1997). Recovery plans provide guidance to the Service, States, and other partners and interested parties on ways to minimize threats to listed species, and on criteria that may be used to determine when recovery goals are achieved. There are many paths to accomplishing the recovery of a species and recovery may be achieved without fully meeting all recovery plan criteria. For example, one or more criteria may have been exceeded while other criteria may not have been accomplished. In that instance, we may determine that, over all, the threats have been minimized sufficiently, and the species' status is robust enough, to downlist or delist the species. In other cases, new recovery approaches and/or opportunities unknown at the time the recovery plan was finalized may be more appropriate ways to achieve recovery. Likewise, new information may change the extent that criteria need to be met for recognizing recovery of the species. Overall, recovery is a dynamic process requiring adaptive management, and assessing a species' degree of recovery is likewise an adaptive process that may, or may not, fully follow the guidance provided in a recovery plan. We focus our evaluation of species status in this 5-year review on progress that has been made toward recovery since the species was listed (or since the most recent 5-year review) by eliminating or reducing the threats discussed in the five-factor analysis. In that context, progress towards fulfilling recovery criteria serves to indicate the extent to which threat factors have been reduced or eliminated.

Since the draft recovery plan was prepared, the Service has shifted to preparing threats-based recovery plans in which actions are directly tied to reducing or eliminating identified threats to the species. As such, the criteria listed below may be of limited relevance or in need of revision.

#### Downlisting Criterion #1:

The priority ranked habitat areas have been protected. Priority for protection shall be determined according, but not limited, to: 1) population size, 2) habitat quality, 3) manageability/defensibility of site, and 4) connectivity. The initial preserve area should be 2,000 hectares (5,000 acres) based on known areas

occupied by the plants and should include protection for the threatened species, *Erigeron parishii* (which is discussed separately under the delisting objective and criteria).

Priority areas and populations include, but are not limited to, the following: 1) Sites within the White Mountain Management Unit; 2) populations just north/northeast of Hitchcock Spring; 3) upper Crystal Creek Drainage; 4) Upper Furnace Canyon and prioritized populations in the lower Furnace Canyon area; 5) populations just north of Holcomb Valley; 6) Arctic Canyon; 7) Marble Canyon; 8) Bertha Ridge and slopes to Big Bear Lake; 9) Monarch Flats and northern slopes; 10) eastern and western slopes of Cushenbury Canyon including the vicinity of Whiskey Springs; 11) Burnt Flat; 12) Blackhawk Mountain and slopes; 13) Round Mountain; 14) Grapevine Creek; 15) Top Spring/Lone Valley/Squirrel Spring; 16) Granite Spring; 17) Arrastre Creek/Rose Mine Valley; 18) Rattlesnake Canyon; 19) Sugarlump/Sugarloaf Mountain; and 20) the outlying populations of *Erigeron parishii* in the Little San Bernardino Mountains. The species and ecosystem-level attributes of these priority areas make them necessary for the survival and recovery of these species. Taxonomic assessment of the eastern populations of *Oxytheca parishii* var. *goodmaniana* may affect the recovery priority and reserve needs of this variety.

To count toward reclassification of the plants, reserves must have been designed to minimize or eliminate indirect threats due to adjacent land uses. This includes protection of carbonate plant habitat from human disturbance to hydrology, soil integrity, fire ecology, habitat microclimates, and light regimes. Appropriate management and restorative measures should reduce habitat-degrading effects such as surface disturbances, windblown sediments, fugitive night lighting, and off-highway vehicle use.

This criterion implicitly addresses listing Factors A (habitat loss) and E (stochastic events). The U.S. Forest Service, the Bureau of Land Management and others have partnered to develop the Carbonate Habitat Management Strategy (Olson 2003). Upon successful implementation of the Carbonate Habitat Management Strategy, habitat preservation will meet or exceed Downlisting Criterion #1 (USFWS 2005a, p. 247). However, the Carbonate Habitat Management Strategy is only a programmatic strategy to allow mining and protect carbonate plants and participation by mining interests is voluntary. Thus, the reserve system under the Carbonate Habitat Management Strategy has not yet been developed and future projects may not be fully implemented under the provisions of the Carbonate Habitat Management Strategy. In addition, the Carbonate Habitat Management Strategy does not explicitly include a strategy for allowing impacts to San Bernardino Mountains bladderpod, although most areas where this species occurs are included in the proposed reserve system. This criterion has not been met at this time.

Downlisting Criterion #2:

Protect additional lands needed to complete otherwise isolated reserves, to protect new populations that may be discovered in the future, and to provide strategic buffer zones and potential population reintroduction and/or expansion areas. The

interim estimate of additional lands needed to secure habitat connectivity, buffers, and natural community context is 1,860 hectares (4,600 acres), including lands to meet Delisting Criterion #2 for *Erigeron parishii*. This figure may be further refined as additional information becomes available.

This criterion implicitly addresses listing Factors A (habitat loss) and E (stochastic events). In addition to the protection of occupied areas, the Carbonate Habitat Management Strategy provides for the conservation of suitable habitat including about 12,022 acres (4,865 hectares) of suitable habitat for Cushenbury milk-vetch (*Astragalus albens*), 15,472 acres (6,261 hectares) for Cushenbury buckwheat, 14,709 acres (5,952 hectares) for Cushenbury oxytheca (*Acanthoscyphus (Oxytheca) parishii* var. *goodmaniana*), and 15,172 acres (6,140 hectares) for Parish's daisy (*Erigeron parishii*) (USFWS 2005b, p. 28). Since the Carbonate Habitat Management Strategy is a programmatic strategy, these lands have not yet been conserved. The Carbonate Habitat Management Strategy does not explicitly include a strategy for allowing impacts to San Bernardino Mountains bladderpod, although most areas where this species occurs and adjacent suitable habitats are included in the proposed Carbonate Habitat Management Strategy reserve system. This criterion has not been met at this time.

#### Downlisting Criterion #3:

Adaptive population monitoring/adaptive management programs must be functioning so that early detection is assured for any population instability or other problems in the reserve system. Studies will have shown whether there is a need for reintroductions and/or augmentations of existing populations. Research results to support adaptive management will be available, including at least preliminary results on pollination ecology, seed dispersal mechanisms, population dynamics, microclimate effects of vegetation removal/bare areas, seedbank dynamics, and fire ecology.

This criterion implicitly addresses listing Factors A (habitat loss) and E (stochastic events). Since the reserve system is not yet in place, this criterion is not yet applicable. Further research has not been completed since the development of the draft San Bernardino Mountains Carbonate Endemic Plants Recovery Plan from 1997 and the listing of San Bernardino Mountains bladderpod regarding pollination ecology, seed dispersal mechanisms, population dynamics, microclimate effects of vegetation removal/bare areas, seedbank dynamics and fire ecology of San Bernardino Mountains bladderpod. This criterion has not been met at this time.

#### Delisting Criteria for the Endangered Taxa:

The reserve system designed to allow downlisting is intended to suffice for delisting, provided that monitoring and research demonstrate that the reserves work as planned to remove the threats identified during the listing process. As monitoring and research results become available, delisting criteria will be established.

As documented above, a reserve system has been planned, but not established. Thus, the necessary monitoring and research has not been completed. This criterion has not been met at this time.

#### IV. SYNTHESIS

San Bernardino Mountains bladderpod still occurs only in a relatively small area of the northeastern San Bernardino Mountains on a particular set of substrates. As documented in the final rule listing San Bernardino Mountains bladderpod as endangered, this species was listed because of threats such as destruction of habitat by activities associated with development, gold mining, off-road vehicle and recreation use and the effects of stochastic events on small populations. The majority of the habitat identified for San Bernardino Mountains bladderpod occurs on U.S. Forest Service lands (Figure 1), where monitoring and management actions are being implemented. The U.S. Forest Service has proposed additional strategies that propose to protect this species. However, mining continues to impact the species' habitat, and recreational activities associated with nearby development continue to negatively impact San Bernardino Mountains bladderpod on U.S. Forest Service lands (USFS 2005). Stochastic events such as drought continue to be a concern. In addition, additional threats have been identified since listing including fire suppression activities. Due to the small area and narrow habitat occupied by this species, the threats identified at listing continue to exist. Additionally, new threats, including fire suppression activities and potential impacts from climate change have been identified. Therefore, we believe San Bernardino Mountains bladderpod should remain listed as endangered at this time.

#### V. RESULTS

##### Recommended Listing Action:

- Downlist to Threatened  
 Uplist to Endangered  
 Delist (indicate reason for delisting according to 50 CFR 424.11):  
      *Extinction*  
      *Recovery*  
      *Original data for classification in error*  
 No Change

##### New Recovery Priority Number and Brief Rationale:

Despite being in danger of extinction throughout all or a significant portion of its range, protections for San Bernardino Mountains bladderpod have increased on National Forest lands, occupied and restorable habitat for this species continues to be threatened by development, mining, recreational activities, and stochastic events. Additionally, conflict with construction or other development projects or other forms of economic activity exists. Therefore, per our guidance, we are changing the Recovery Priority Number to 9C, indicating that this plant subspecies has a moderate degree of threat, a high potential for recovery, and is the subject of conflict.

## **VI. RECOMMENDATIONS FOR ACTIONS OVER THE NEXT 5 YEARS**

### Finalize Recovery Plan

Prepare a new threats-based recovery plan specific to San Bernardino Mountains bladderpod that identifies a recovery strategy, objectives, and criteria for reclassification to threatened, objectives and specific criteria for removal from the list of endangered and threatened species, and prioritizes recovery actions.

In the interim, seek implementation of elements of the Carbonate Habitat Conservation Strategy that have direct benefit to the conservation of *Physaria kingii* subsp. *bernardina*.

### Monitor Existing Populations

Work with the San Bernardino National Forest to conduct systematic monitoring of San Bernardino Mountains bladderpod throughout known and potentially occupied sites as necessary to track the status of the species and identify management priorities. There is a need to continue to obtain quantitative information regarding the status of this species to evaluate the effectiveness of conservation efforts over time, especially in light of potential effects associated with global climate change..

### Management of Occupied San Bernardino Mountains Bladderpod Habitat

Work with partners, such as the San Bernardino National Forest, to help conserve San Bernardino Mountains bladderpod by identifying opportunities to:

- a) Continue monitoring programs for the effectiveness of measures to protect San Bernardino Mountains bladderpod from recreational activities and make adjustments to signs, barriers, and roads as necessary.
- b) Avoid new developments in or near San Bernardino Mountains bladderpod habitat.

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**U.S. FISH AND WILDLIFE SERVICE  
5-YEAR REVIEW**

***Physaria (Lesquerella) kingii* subsp. *bernardina*  
(San Bernardino Mountains bladderpod)**

**Current Classification:** Endangered

**Recommendation Resulting from the 5-Year Review:**

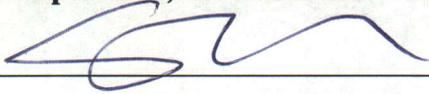
- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

**Review Conducted By:** Carlsbad Fish and Wildlife Office

**FIELD OFFICE APPROVAL:**

**ACTING** Lead Field Supervisor, U.S. Fish and Wildlife Service

Approve



Date

**AUG 13 2009**

**Scott A. Sobiech**