Erigeron parishii
(Parish's daisy)

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

Erigeron parishii (Parish's daisy)

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 (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:

Parish's daisy is a small perennial herb the Asteraceae (Aster family). Parish's daisy generally occurs with soils derived from limestone, dolomite, or a mixture of limestone and dolomite (Tierra Madre Consultants 1992, p. 33). Parish's daisy 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 Parish's daisy. Additionally, we received one comment letter on May 6, 2008, (J. Potter, State of California, Department of Justice, *in litt*. 2008), addressing a number of species, including Parish's daisy, 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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Lead Field Office: Jesse Bennett, Fish and Wildlife Biologist, and Bradd Bridges, Recovery Branch Chief, Carlsbad Fish and Wildlife Office; 760-431-9440

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: *Erigeron parishii* (Parish's daisy); a plant species
Classification: Threatened

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 Parish's daisy is 8C 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 taxon is a species that faces a moderate degree of threat and has a high potential for recovery. The "C" indicates conflict with construction or other development projects or other forms of economic activity.

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

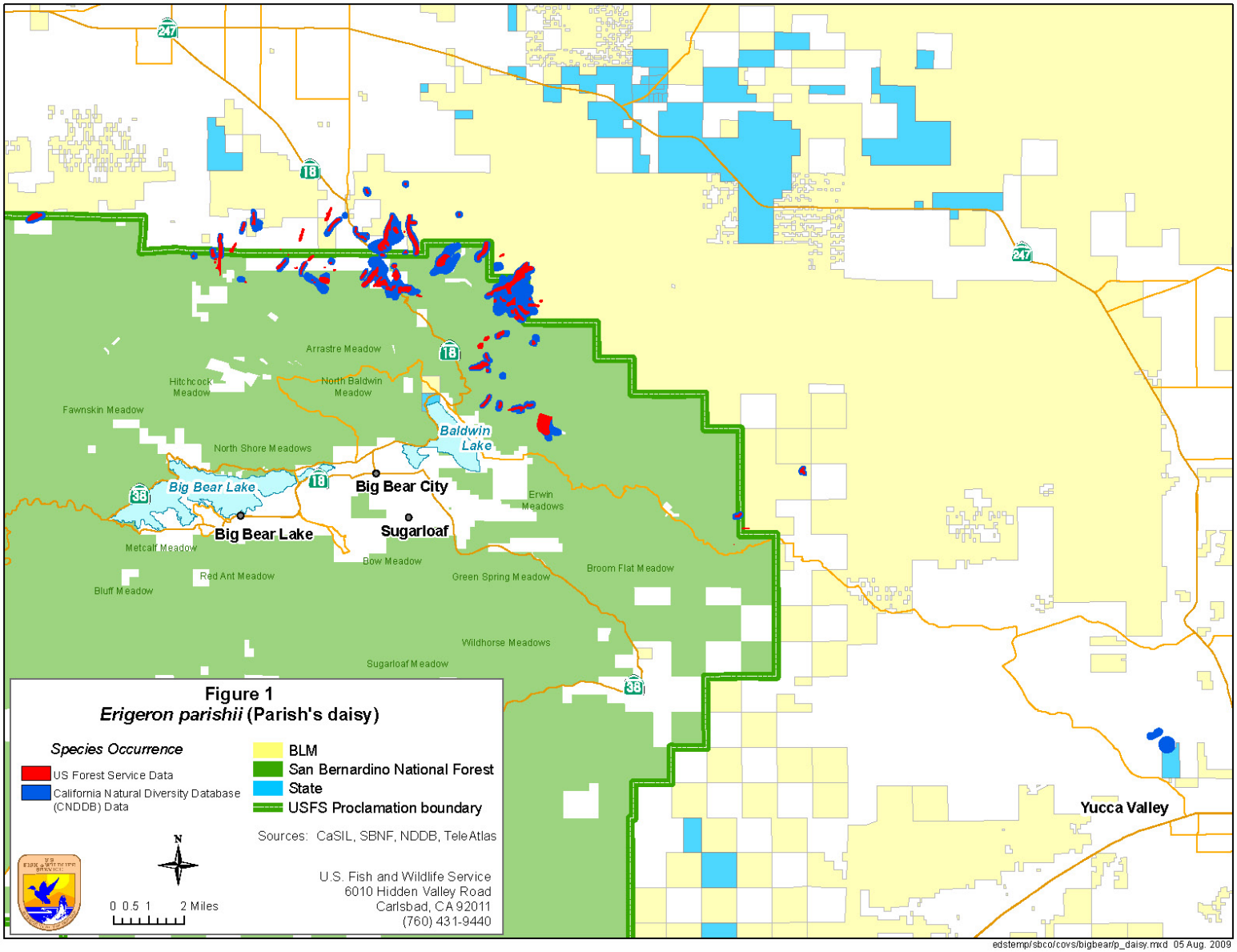
Parish's daisy is a small perennial herb in the aster family (Asteraceae) that reaches 4 to 12 inches (10 to 30 centimeters) in height (Nesom 1993, p. 260). The leaves are 1 to 2 inches (2 to 5 centimeters) long, simple, linear and covered with soft, silvery hairs (Nesom 1993, p. 260). Flower heads are solitary and borne at the tips of leafy stems, with bluish to pink or white ray flowers and yellow disk flowers. Grayish-green glandular bracts surround each flower head (USFWS 2002, p. 78571). Parish's daisy generally flowers between May and June (CNPS 2001).

Spatial Distribution

The range of Parish's daisy spans approximately 35 miles (56 kilometers) along the "belt" of carbonate soils that occur along the northern edge of the San Bernardino Mountains, north and east of Big Bear Lake, San Bernardino County, California, and east toward Pioneertown and Joshua Tree National Park (USFWS 2002, p. 78571) (Figure 1). Historical collections of this plant were made from Rattlesnake Canyon south of Old Woman Springs, and from Long Canyon in the Little San Bernardino Mountains in Joshua Tree National Park (USFWS 1994, p. 43653). Additionally, recent collections from Long Canyon in 2005 and 2006 are reported in the herbarium of Rancho Santa Ana Botanic Garden (Consortium of California Herbaria database; accessed August 12, 2009) (not mapped in Figure 1). There are about 1,029 acres of Parish's daisy occupied habitat (Olson 2003, p. 19) (see below under "Habitat or Ecosystem" for definition of occupied). The range and distribution of the species is essentially the same as it was at the time of listing.

Abundance

According to the final listing rule, Parish's daisy was known from fewer than 25 occurrences with a total population size of about 16,000 individuals (USFWS 1994, p. 43653). Less than a third of the occurrences had more than 1,000 individuals (USFWS 1994, p. 43653). The San Bernardino National Forest has mapped 87 site-specific occurrences (USFWS 1994, p. 78571). However, what constitutes an "occurrence" has been subjectively defined over various surveys, making it difficult to specify the change in the status of Parish's daisy since listing. Moreover, there has likely been an increase in survey effort since listing, resulting in an increase in the number of occurrences detected; this may not necessarily translate to an actual increase in abundance.


247
18
38
Arrastre Meadow
Hitchcock Meadow
North Baldwin Meadow
Fawnskin Meadow
Baldwin Lake
North Shore Meadows
Big Bear Lake
Big Bear City
Big Bear Lake
Sugarloaf
Erwin Meadows
Metcalf Meadow
Bow Meadow
Broom Flat Meadow
Red Ant Meadow
Green Spring Meadow
Bluff Meadow
Wildhorse Meadows
Sugarloaf Meadow
Yucca Valley
Figure 1
Erigeron parishii (Parish's daisy)
Species Occurrence
US Forest Service Data
California Natural Diversity Database (CNDDB) Data
BLM
San Bernardino National Forest
State
USFS Proclamation boundary
Sources: CaSIL, SBNF, NDDB, TeleAtlas
N
0 0.5 1 2 Miles
U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, CA 92011
(760) 431-9440
edstemp/sbco/covs/bigbear/p_daisy.mxd 05 Aug. 2009

Habitat or Ecosystem

Parish's daisy is typically found associated with pinyon woodlands, pinyon-juniper woodlands, and blackbush scrub vegetation communities (Neel 2000, p. 162) from 3,842 to 6,400 feet (1,171 to 1,950 meters) in elevation (USFWS 2002, p. 78572). It usually grows on rocky slopes, active washes, and outwash plains on substrate derived from limestone or dolomite. Some occurrences are found on a granite/limestone interface characterized by a granitic parent material overlain with an outwash of limestone materials (USFWS 1994, p. 43653). At the Burns Pinyon Ridge Reserve and at an adjacent occurrence near Pioneertown, the species occurs on quartz monzonite soils with no apparent limestone alluvium (Neel 2000, p. 186).

The Carbonate Habitat Management Strategy (Olson 2003) (see below) 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 is one unit of critical habitat designated for Parish's daisy (the Northeastern Slope Unit). It includes 4,420 acres (1,790 hectares) along the northeastern slope of the San Bernardino Mountains and includes the White Mountains at the western edge to Rattlesnake Canyon at the eastern edge (USFWS 2002, p. 78580). The San Bernardino National Forest and Bureau of Land Management lands include 3,280 acres (1,330 hectares) of critical habitat, while 1,140 acres (460 hectares) are on private land (USFWS 2002, p. 78580). The Northeastern Slope Unit is essential to Parish's daisy because it provides suitable carbonate substrates and carbonate-derived soils with intact natural surfaces, associated plant communities, and important core occurrences.

The primary constituent elements of Parish's daisy designated critical habitat include: 1) soils derived primarily from upstream or upslope limestone, dolomite, or quartz monzonite parent materials that occur on dry, rocky hillsides, shallow drainages, or outwash plains at elevations between 3,842-6,400 feet (1,171 to 1,950 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.

Changes in Taxonomic Classification or Nomenclature

There have been no changes in taxonomy or nomenclature for this species.

Genetics

Neel and Ellstrand (2001) sampled Parish's daisy for allozyme diversity and found that this species had not experienced severe or long-lasting bottlenecks. They suggested that either substantial gene flow among populations was occurring or that populations had not been separated long enough to detect genetic drift.

Species-specific Research and/or Grant-supported Activities

Padgett et al. (2007) conducted a study examining dust deposition from mining activities and potential effects to Parish's daisy and other carbonate plant species. The study documented lower photosynthetic activity and less growth for plants near mining activities due to dust. The authors provided the following recommended mitigation measures: 1) maintain vegetation buffers around mining operations, 2) keep mining activities contained and contiguous, and 3) cover and replant mining areas no longer in use.

Mistretta and White (2001) introduced Parish's daisy onto a disturbed site in 1991–1992 and irrigated the species. They found that about 66 percent of the individuals survived to the 1998 monitoring period and estimated the average half-life of the plant to be 28 years. The Parish's daisy successfully reproduced and progeny were found within 6.6 feet (2 meters) of the planting. Mistretta and White (2001) suggested that Parish's daisy was not dependent upon specialized pollinators or soil microorganisms due to the success of the species at the disturbed site and in botanical gardens. Mistretta and White (2001) indicate that Parish's daisy appears to have high annual seedling production and mortality, but only a moderate annual increase in plants.

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 mining was described as the major threat to Parish's daisy (USFWS 1994, p. 43658). Much of the approximately 32,620 acres (13,200 hectares) of carbonate substrates in the San Bernardino Mountains are under claim for mining, including 73 percent of Parish's daisy occupied habitat (USFWS 1997, pp. 14 and 24). Additional threats to its habitat included urban development, off-highway vehicle use, and an energy development project. The final listing rule indicated that urban development threatened an occurrence of Parish's daisy near Pioneertown. Additionally, the final listing rule indicated that a 115-kilovolt powerline proposed for construction through Cushenbury Canyon could affect this species (USFWS 1994, p. 43659).

Mining activity remains the primary threat for Parish's daisy (USFWS 2005a, p. 246). Mining can impact habitat through the removal of mined materials, disposal of overburden, and road construction (USFWS 1997, pp. 17–18). Dust can affect Parish's daisy by altering soil chemistry and light penetration into seedbanks (USFWS 1997, p. 17–18). Artificial lighting may affect Parish's daisy's growing conditions by altering the photoperiod response or the behavior of pollinators or seed dispersers (USFWS 1997, p. 18).

Since listing of Parish's daisy, the U.S. Forest Service and Bureau of Land Management have partnered to develop the Carbonate Habitat Management Strategy (Olson 2003) as described in Factor D. Upon successful implementation of the Carbonate Habitat Management Strategy, habitat preservation will meet or exceed recovery criteria 1 and 2 in the draft Recovery Plan (USFWS 2005a, p. 247). However, mining projects can still be proposed and implemented

outside the confines of the Carbonate Habitat Management Strategy (Olson 2003, p. 6). Thus, the Carbonate Habitat Management Strategy has the potential to reduce the threats associated with mining activities, but it is not yet clear whether the strategy will be effective.

The final listing rule indicated off-road vehicle use and energy development projects were a threat to Parish's daisy. Such activities could impact the species' habitat through ground disturbance or dust creation. About 6 acres (2 hectares) of occupied habitat and 20 acres (8 hectares) of designated critical habitat for Parish's daisy overlap with roads and motorized vehicle trails (USFWS 2005a, p. 256). The San Bernardino National Forest has closed road 3N77 and placed signs and barriers for the other roads (USFWS 2001, p. 18), which should help limit impacts due to off-road vehicle use. Additionally, road 3N11A is proposed for decommissioning and roads 3N03D, 3N54, 3N88, and 3N88B are proposed for reclassification as administrative use only (USFWS 2009, p. 2), which should reduce vehicle activity in the area and further reduce the threat to the species. We are unaware of any energy development or off-highway vehicle projects occurring since listing that affect Parish's daisy.

Several threats such as dispersed target shooting, dispersed camping areas, fuelwood collection, and fire suppression activities have been identified since listing (USFWS 2001, pp. 4−11). These activities can result in trampling of Parish's daisy and impact its habitat through ground disturbance or dust creation. In addition, fire suppression activities can result in ground disturbance through fire line construction, retardant and water drops, and establishment of fire camps.

The U.S. Forest Service has taken steps to avoid or minimize impacts due to threats identified since listing (USFWS 2001). 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. Finally, the U.S. Forest Service has distributed maps of Parish's daisy occurrences to fire-fighting personnel and provided guidance to avoid these areas to the extent practicable during fire suppression activities (USFWS 2001, p. 19). Due to the relatively unpredictable nature of future fire suppression activities, it is unclear what level of impacts may occur. Additionally, due to the rugged and remote terrain where Parish's daisy occurs, dispersed recreational activities such as camping should have a low level of impact. Thus, the magnitude of these threats is small or will likely be reduced over the foreseeable future.

Since listing of Parish's daisy, the U.S. Forest Service has adopted additional guidance and proposals to protect this species. The revised Land Management Plans for the four southern California national forests (USFWS 2005a) 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, new activities will be neutral or beneficial to Parish's daisy and expansion of existing facilities or new facilities will focus recreational use away from Parish's daisy habitat. Exceptions were included for fuel abatement activities ("fuel treatments") in wildland-urban interface areas and to allow for projects with short-term effects but long-term benefits (USFWS 2005a, p. 15). However, these plans are strategic; that is, projects could still occur outside the parameters of these documents.

In addition to the adoption of land use zoning and standards, the U.S. Forest Service proposed the Blackhawk Research Natural Area, which covers about 67 acres (27 hectares) of occupied habitat and 317 acres (128 hectares) of designated critical habitat for Parish's daisy (USFWS 2005a, p. 255). If designated, this area will be subject to the U.S. Forest Service policy for Research Natural Areas, which indicates that "Research Natural Areas may only be used for research, study, observation, monitoring, and those educational activities that maintain unmodified conditions" (USFWS 2005a, p. 327). This proposed Research Natural Area has not been finalized (S. Eliason, San Bernardino National Forest, pers. comm. 2008).

Under the West Mojave Plan developed by the Bureau of Land Management, Parish's daisy would not be affected by mining activities on 237 acres (96 hectares) of occupied habitat and 940 acres (380 hectares) of designated critical habitat (USFWS 2006, pp. 146 and 147). However, other development could potentially occur on up to 52 acres (21 hectares) of occupied and designated critical habitat for Parish's daisy (USFWS 2006, p. 147). Additional development would still be subject to consultation under section 7 of the Act (see Factor D).

Finally, in 1999 the Service issued a non-jeopardy biological opinion on the effects of a proposed limestone quarry on Parish's daisy near Rattlesnake Canyon. The proposed project included about 5 acres (2 hectares) of surface disturbance and production of 86,000 tons (78,000 megagrams) of limestone per year (USFWS 2006, p. 141).

Summary of Factor A

In summary, mining, the primary threat identified at listing, remains the main threat to Parish's daisy because 73 percent of the species' habitat is under claim for mining or subject to other disturbance. Mining can impact this species' habitat through removal and burial of suitable soils that eliminate habitat areas, through creation of dust that can alter soil chemistry and light availability for seeds, and through artificial lighting that may alter the species' growing conditions. Off-road vehicle use and energy development projects could impact the species' habitat though ground disturbance or dust creation. Several threats such as dispersed target shooting, dispersed camping areas, fuelwood collection, and fire suppression activities have been identified since listing. However, the magnitude of these threats has been reduced through regulatory mechanisms, including implementation of the Act and actions taken by the U.S. Forest Service. Additionally, the Carbonate Habitat Management Strategy and revised Land Management Plans are anticipated to reduce the threats from mining, provided their non-mandatory measures are implemented.

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

The final rule listing Parish's daisy 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 Parish's daisy.

FACTOR C: Disease or Predation

Disease and predation are not known to be threats affecting Parish's daisy. The threat of predation from burro grazing was identified after listing (USFWS 2001). However, burros are expected to have minimal effects to Parish's daisy due to the low numbers of burros present (about 60), the dispersal of the burros across a large area, the burros preference for wetter habitats, and the short stature and scarce nature of carbonate plants, which makes foraging on them unlikely (USFWS 2001, p. 39).

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 and the California Endangered Species Act were noted as potentially offering some protection for Parish's daisy. 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 Parish's daisy 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. Parish's daisy is on the California Native Plant Society Inventory as List 1B. Under 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.

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, this regulatory mechanism may not be adequate to 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 resulted in impacts to Parish's daisy 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 Parish's daisy habitat (USFWS 2001). The primary activities included mining, roads, and trails. In 2005, a document conveying our non-jeopardy biological and conference opinions (USWFS 2005a) was issued that addressed the revised Land Management Plans for the four southern California national forests (see Factor A). However, at the time of this 5-year review, aspects of this opinion are being challenged in court. The Act also contributes to the species' conservation through avoidance, minimization, and conservation measures incorporated into project descriptions through implementation of section 7. In sum, the Act is an adequate regulatory mechanism protecting the species.

National Park Service Organic Act: The occurrence in Long Canyon is in Joshua Tree National Park is subject to the National Park Service Organic Act of 1916 (39 Stat. 535, 16 U.S.C. 1, as amended), which states that the National Park Service "shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . to conserve the scenery and the national and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The National Park Service Management Policies indicate that the Park Service will "meet its obligations under the National Park Service Organic Act and the Endangered Species Act to both pro-actively conserve listed species and prevent detrimental effects on these species." This includes working with the Service and undertaking active management programs to inventory, monitor, restore, and maintain listed species habitats, among other actions. Only a small portion of the species' range occurs on National Park lands; thus, the regulatory mechanisms associated with the National Park Service Organic Act are inadequate to protect the species.

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 2005). 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. However, on March 30, 2007, the United States District Court in *Citizens for Better Forestry et al. v. USDA* (N.D. Calif.) enjoined the United States from implementing and utilizing the 2005 rule until it complied 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 Parish's daisy 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. 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 Parish's daisy, the Act is the primary regulatory mechanism mandating Parish's daisy 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 Parish's daisy 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, and this threat still exists. The potential for stochastic extinction is enhanced by habitat loss and fragmentation and drought. 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.

Climate change is a threat that was not mentioned in the final listing rule for Parish's daisy. This issue was also 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 kilometers) southeast of the San Bernardino Mountains 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 about 215 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).

Parish's daisy is endemic to isolated occurrences of particular carbonate soils in the San Bernardino Mountains and near Pioneertown to the east. 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. There will be no suitable habitat when the elevational range exceeds the species' maximum elevation. Even before then, the density and distribution may concentrate the species 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 specifically 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 from September 1997 includes Parish's daisy (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.

Because Parish's daisy occurs in areas outside the range of other carbonate plants species, the draft San Bernardino Mountains Carbonate Endemic Plants Recovery Plan includes separate recovery criteria for this species. Unlike the other carbonate plant species, this species is listed as threatened (as opposed to endangered). Thus, this species does not have "downlisting" criteria. Instead, the recovery plan uses the downlisting criteria for the other endangered carbonate plant species as the basis for the delisting criteria for Parish's daisy. As such, both the delisting criteria for Parish's daisy and, where appropriate, the associated downlisting criteria for the endangered carbonate species are listed below.

Delisting Criterion #1:

> Consistent with Downlisting Criterion #1, essential extant populations of *Erigeron parishii* are conserved on public lands specified in Downlisting Criterion #1 for the endangered carbonate plants [see below], plus lands where *Erigeron parishii* is the only listed plant, in order to represent the southeastern portion of *Erigeron*'s range, with connections to other populations and reserves. Priority of protection will be determined by the ranking factors in Downlisting Criterion #1 for the four other carbonate plants (excepting the need for *Erigeron parishii* sites to represent the southeastern portion of its range).

Downlisting Criterion #1 for the Endangered Carbonate Plants:

> 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 and Bureau of Land Management have partnered to develop the Carbonate Habitat Management Strategy. The goals of the Carbonate Habitat Management Strategy are to: 1) protect the listed plants and the habitat components they require; 2) guide impact minimization and compensation for unavoidable impacts; 3) streamline reviews of mining activities in carbonate plant habitat; 4) guide habitat restoration; and 5) plan and provide for long-term needs of both the mining industry and listed species conservation. One of the primary goals of the Carbonate Habitat Management Strategy is the establishment of 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 Parish's daisy and other federally listed carbonate plant species. Upon successful implementation of the Carbonate Habitat Management Strategy, habitat preservation will meet or exceed Delisting Criterion #1, with the exception that the southeastern occurrences of Parish's daisy are not part of this strategy (Olson 2003, p. 6). This includes preservation of at least 761 acres (308 hectares) (75 percent) of occupied habitat and 2,357 acres (954 hectares) (53 percent) of designated critical habitat for Parish's daisy (USFWS 2005b, pp. 24 and 27). However, the Carbonate Habitat Management Strategy is only a programmatic strategy to allow mining and protect carbonate plants. Participation by mining interests is voluntary. Thus, the reserve system under the Carbonate Habitat Management Strategy is not yet developed and future projects may or may not be implemented under the provisions of the Carbonate Habitat Management Strategy. This criterion has not been met at this time.

Delisting Criterion #2:

> Any additional lands necessary to connect otherwise isolated reserve areas, provide strategic buffer zones and potential population reintroduction expansion areas are protected. This criterion may be fulfilled in conjunction with Downlisting Criterion #2 [for the endangered carbonate plants (see below)].
>
> Downlisting Criterion #2 for the Endangered Carbonate Plants:
>
> > 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 15,172 acres (6,140 hectares) of suitable habitat for Parish's daisy (USFWS 2005b, p. 28). Because the Carbonate Habitat Management Strategy is only a programmatic strategy, these lands have not yet been conserved. This criterion has not been met at this time.

Delisting Criterion #3:

> Early detection of problems in the reserve system is assured through adaptive population monitoring/adaptive management programs. Protocols for responding to problems are in place. Ecological restoration of human-disturbed sites (closed

> OHV [off-highway vehicle] roads, abandoned quarries, etc.) that formerly affected *Erigeron parishii* habitat is in progress.

This criterion addresses listing Factors A (habitat loss) and E (stochastic events). Because the reserve system is not yet in place, this criterion is not yet applicable. Further, focused research on pollination ecology, seed dispersal mechanisms, population dynamics, microclimate effects of vegetation removal/bare areas, seedbank dynamics, and fire ecology of Parish's daisy has not yet occurred beyond studies by Mistretta and White (2001) and Neel and Ellstrand (2001) which are described in "Species-specific Research and/or Grant-supported Activities" section above. This criterion has not been met at this time.

IV. SYNTHESIS

The number of occurrences detected has increased since listing, but variation in how occurrences have been defined over time makes this difficult to assess. Nevertheless, it is likely that any increase is not the result of an actual increase in abundance in Parish's daisy, but is instead an increase in survey effort since listing. Parish's daisy, like other carbonate plant species, is confined to certain soils in a relatively small area of habitat in the northeastern San Bernardino Mountains. The final rule documents that Parish's daisy was likely to become an endangered species throughout all or a significant portion of its range due to the threat of mining, off-road vehicle and other recreational use, energy development projects, and the effects of stochastic events on small populations. While some actions by the U.S. Forest Service have reduced impacts associated with off-road vehicle activities and recreational use, and programmatic strategies have been developed to conserve Parish's daisy, mining continues to threaten to impact about 73 percent of the species' habitat, and stochastic events may affect the species throughout its range. Additionally, other threats have been identified since listing, including fire suppression activities and the effects associated with global climate change. Therefore, Parish's daisy should remain listed as threatened. Upon successful implementation of the programmatic strategies to establish a permanent reserve system for Parish's daisy, this conclusion should be reconsidered.

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*
__X__ No Change

New Recovery Priority Number and Brief Rationale:

While protections for Parish's daisy have increased on national forest lands, occupied and restorable habitat for this species continues to be threatened by mining. Therefore, the Recovery Priority Number remains 8C, indicating that this plant species 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 Parish's daisy that identifies a recovery strategy, objectives, and criteria for delisting.

In the interim, seek implementation of elements of the Carbonate Habitat Conservation Strategy that have direct benefit to the conservation of Parish's daisy.

Monitor Existing Populations

Work with the San Bernardino National Forest to conduct systematic monitoring of Parish's daisy 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 Parish's Daisy Habitat

Work with partners, such as the San Bernardino National Forest, to help conserve Parish's daisy by identifying opportunities to:

a) Continue monitoring programs for the effectiveness of measures to protect Parish's daisy from recreational activities and make adjustments to signs, barriers, and roads as necessary.

b) Avoid new developments in or near Parish's daisy habitat.

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

Erigeron parishii
(Parish's daisy)

Current Classification: Threatened

Recommendation Resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X_ 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