

*Eriodictyon altissimum*  
(Indian Knob Mountainbalm)

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



**U.S. Fish and Wildlife Service  
Ventura Fish & Wildlife Office  
Ventura, California  
January 2009**

## **5-YEAR REVIEW**

### ***Eriodictyon altissimum* (Indian Knob Mountain Balm)**

#### **I. GENERAL INFORMATION**

##### **1.A. Purpose of 5-Year Review:**

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act (ESA) to conduct a status review of each listed species at least once every 5 years to ensure that its classification as threatened or endangered provides the appropriate level of protection. We consider the best available scientific and commercial data on the species, and focus on new information since the species was listed. The purpose of our review is to evaluate whether or not the species' status has changed since listing, and whether reclassification or delisting should be considered. Our original listing of a species as endangered or threatened is based on the existence of one or more of the five threat factors described in section 4(a)(1) of the ESA, and we must consider these same five factors in any subsequent reclassification or delisting of a species. A 5-year review contains an analysis of updated information on the species' biology and threats, and we interpret progress towards recovery in the context of eliminating or reducing the five threat factors. 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 ESA that includes public review and comment.

##### **1.B. Species Overview:**

*Eriodictyon altissimum* is a perennial plant species endemic to southwestern San Luis Obispo County, California. It is included in the borage family (Boraginaceae) (JOI 2008). The species was first collected on Indian Knob by Philip V. Wells in 1960 and described by him two years later (Wells 1962). *Eriodictyon altissimum* is a relatively weak, diffusely-branched evergreen shrub that can reach heights between 6 to 13 feet (2 to 4 meters). The linear leaves are somewhat sticky and the lavender flowers are arranged in coiled clusters. Although new growth is primarily from rhizomatous suckers, the flowers also produce numerous tiny seeds. *Eriodictyon altissimum* occurs within coastal dune scrub and coastal chaparral plant communities where it grows on tarsand or sandy loam soils.

##### **1.C. Methodology used to complete the review**

The U.S. Fish and Wildlife Service (Service), published a *Federal Register* (FR) notice (70 FR 39327) announcing our initiation of a 5-year review of *Eriodictyon altissimum* and asking the public for information. No comments were submitted. As part of the status review, information in our files regarding *Eriodictyon altissimum*, including any scientific papers, survey reports, and letters to and from the Ventura Fish and Wildlife Office regarding this endangered plant species, was reviewed. Botanical experts and other knowledgeable individuals were contacted to solicit information that may have been gathered since the completion of the recovery plan in 1998. A site visit to several of the sites was also conducted to determine either the status of the plants or condition of surrounding habitat. This status review incorporates all relevant comments and

information from our files and these parties. No comments were received during the public comment period.

## **I.D. Reviewers**

### **Lead Regional Office --Contact name(s) and phone numbers:**

R8, California and Nevada Operations Office:

Diane Elam, Deputy Division Chief for Listing, Recovery, and Habitat Conservation Planning, and John Robles, Fish and Wildlife Biologist, 916-414-6464

### **Lead Field Office --Contact name(s) and phone numbers:**

Ventura Fish & Wildlife Office:

Julie M. Vanderwier, Fish and Wildlife Biologist, 805-644-1766  
Connie Rutherford, Recovery Coordinator (Plants), 805-644-1766

## **I.C. Background**

### **I.C.1. FR Notice citation announcing initiation of this review:**

A *Federal Register* notice was published on March 22, 2006 (71 FR 14538) and initiated a 60-day request for information. A second notice was published on April 3, 2006 (71 FR 16584) to clarify the contact offices.

### **I.C.2. Species status:**

In the 2008 recovery data call, we categorized the status of *Eriodictyon altissimum* populations as stable.

### **I.C.3. Listing history**

#### Original Listing

FR notice: 59 FR 64613

Date listed: December 15, 1994

Entity listed: Species (*Eriodictyon altissimum*)

Classification: Endangered

### **I.C.4. Associated rulemakings:**

None.

### **I.C.5. Review History:**

This is the first detailed status review conducted for this species since its listing in 1994. In support of the draft and final recovery plan that addresses *Eriodictyon altissimum*, minor status reviews were conducted; however, a thorough analysis of the species' status was not performed.

### **I.C.6. Species' Recovery Priority Number at start of review:**

2C. This indicates a full species facing a high degree of threat and a high recovery potential. The "C" indicates a potential conflict with economic activities.

### **I.C.7. Recovery Plan or Outline**

Name of plan: *Recovery Plan for the Morro Shoulderband Snail and Four Plants from Western San Luis Obispo County, California.*

Date issued: September 26, 1998

Dates of previous revisions: There have been no revisions to the recovery plan since its issuance in 1998.

## **II. REVIEW ANALYSIS**

### **II.A. Application of the 1996 Distinct Population Segment (DPS) policy**

The Act defines species as including any subspecies of fish or wildlife or plants and any distinct population segment of any species of vertebrate wildlife. This definition limits listings as distinct population segments (DPS) only to vertebrate species of fish and wildlife. Because *Eriodictyon altissimum* is a plant and the DPS policy is not applicable, the application of the DPS policy to the species listing is not addressed further in this review.

### **II.B. Recovery Criteria**

#### **II.B.1. Does the species have a final, approved recovery plan containing objective, measurable criteria?**

Yes.

#### **II.B.2. Adequacy of recovery criteria**

##### **II.B.2.a. Do the recovery criteria reflect the best available and most up-to-date information on the biology of the species and its habitat?**

The final recovery plan was published in 1998. Since that time the known range has expanded slightly (an extension of the known occurrence at Indian Knob); however, the recovery plan still provides the most current information on the biology of the species and its habitat.

**II.B.2.b. Are all of the 5 listing factors\* that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?**

Yes.

**II.B.3. List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information. For threats-related recovery criteria, please note which of the 5 listing factors\* are addressed by that criterion. If any of the 5-listing factors are not relevant to this species, please note that here.**

The recovery objective for *Eriodictyon altissimum* is its downlisting to threatened status. There are currently no delisting criteria. The recovery plan states that *Eriodictyon altissimum* can be considered for downlisting when all three of the following have been achieved: (1) at least five occurrences from throughout its range are on lands secure from human-induced threats; (2) surrounding habitat is protected in amounts adequate to permit management of the vegetation community using prescribed fire, if it is deemed beneficial to the species; and (3) populations are projected to be self-sustaining and either stable or increasing as determined by long-term monitoring and research results.

**Recovery Criterion 1:** At least five occurrences from throughout its range are on lands secure from human-induced threats (addresses Factor A). This criterion is relevant and up-to-date. This criterion has been partially met.

The primary, human-induced threat is considered to be habitat loss. Six element occurrences, each considered a population for purposes of this status review, are recorded in the California Natural Diversity Database (CNDDDB) (CNDDDB 2008) (see Figure 1). We are not aware of any other unrecorded occurrences. The total number of individuals for all sites in the CNDDDB is estimated to be less than 600.

Element occurrence 1 is reported from a parcel now owned by the Los Osos Community Services District and commonly referred to as the Broderon parcel. At one time, approximately 30 individuals were present; however, none were

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\* A) Present or threatened destruction, modification or curtailment of its habitat or range;  
B) Overutilization for commercial, recreational, scientific, or educational purposes;  
C) Disease or predation;  
D) Inadequacy of existing regulatory mechanisms;  
E) Other natural or manmade factors affecting its continued existence.

located during a search in 1985 (CNDDDB 2008). This parcel was to be conserved pursuant to a section 7 consultation (1-8-04-F-48); however, the biological opinion is no longer valid and the site's status is unclear.

Element occurrences 2 and 3 are found in Hazard Canyon within Montaña de Oro State Park. This park unit is owned and managed by the California Department of Parks and Recreation (CDPR) as part of the San Luis Obispo South Coast Division. The number of plants at each occurrence is estimated to be 40 and 7, respectively (CNDDDB 2008).

Element occurrences 4 and 6 are found on lands that were privately held at the time of listing but are part of the Morro Dunes Ecological Reserve owned by the California Department of Fish and Game. Element occurrence 4 consists of approximately 30 individuals while element occurrence 6 is estimated to be 50 individuals or less. Element occurrence 4 was revisited in the fall of 2005 by Fish and Wildlife Biologist Julie Vanderwier; however, a count of individuals was not made. There is currently no active management plan for this area but inclusion of lands occupied by *Eriodictyon altissimum* within this ecological reserve now protects the species from the direct effects of habitat loss that could have resulted from development.

Element occurrence 5 is found in and around Indian Knob on the private lands of Guidetti Ranch. This occurrence is the type locality for the species. A site visit was conducted by Fish and Wildlife Biologist Julie Vanderwier on May 18, 2006, and, while a count of individuals was not made, the number and distribution of *Eriodictyon altissimum* approximates or exceeds what was observed in 1980 (Vanderwier, in litt. 1987). There is no management plan for element occurrence 5; all of those plants found on the Guidetti property are conserved in an open space easement dedicated to the City of San Luis Obispo (City of San Luis Obispo 1996, 2001). As the purpose of the easement is to ensure the subject property is preserved forever in its natural, scenic, and open space condition, it precludes both development and surface oil exploration or extraction activities. Surveys on a contiguous property conducted in 1991, as part of the proposed development of Parcel Map CO 90-080, identified additional plants in Baron Canyon. Impacts to *Eriodictyon altissimum* that would have occurred as part of the development of this area were avoided by project redesign (Oyler, in litt. 1991) and memorialized in a memorandum of understanding with the California Department of Fish and Game (Althouse and Meade 1999; Althouse, in litt. 1999). This extension of the Indian Knob occurrence increased the estimated total for element occurrence 5 to at least 350 plants (Service 1998).

**Recovery Criterion 2:** Surrounding habitat is protected in amounts adequate to permit management of the vegetation community using prescribed fire, if it is deemed beneficial to the species (addresses Factor A).

Although there are no specific studies that demonstrate that persistence of occurrences of *Eriodictyon altissimum* requires fire, it is generally accepted that fire is the natural agent that maintains the open nature of the habitat where the species fares best (The Nature Conservancy, in litt. 1985; California Native Plant Society, in litt. 1987; Keil, in litt. 1997). Mechanical clearing of habitat as part of utility road maintenance appears to have served this function at Indian Knob (Vanderwier, personal observations 1980, 2006). *Eriodictyon altissimum* exhibits all of the characteristics of a seral (pioneer) species. It can reproduce vigorously by seed or rhizome and is relatively short-lived. It is most commonly observed in open areas within, or at the edge of, a closed canopy chaparral community.

The California Department of Parks and Recreation proposes to conduct prescribed burns within Montaña de Oro State Park as part of covered activities for this park unit in their draft HCP for the San Luis Obispo South Coast District and Oceano Dunes State Vehicular Recreation Area (CDPR 2004). This could benefit element occurrences 2 and 3. The landscape surrounding element occurrences 1 (Broderson), 4 and 6 (Morro Dunes Ecological Reserve) and 5 (Indian Knob) is being encroached upon by large lot estate and residential development such that public sentiment would likely oppose such an activity.

We no longer consider this criterion to be adequate and appropriate with respect to the recovery of the species because: 1) the proximity of several occurrences to urban areas makes it unlikely that jurisdictions would implement prescribed burns in these areas; and 2) it is our opinion that other methods (e.g., mechanical clearing of chaparral) may be available for managing the vegetation in a fashion that would allow maintenance of open areas needed for the continued survival of *Eriodictyon altissimum*.

**Recovery Criterion 3:** Populations are projected to be self-sustaining and either stable or increasing as determined by long-term monitoring and research results (addresses Factors A and E).

While five of the six known occurrences are extant and anecdotal information indicates that they are self-sustaining and stable, no focused surveys or monitoring have been conducted to confirm this. Therefore, this criterion has not been met.

We consider this criterion to be adequate and appropriate with respect to the recovery of the species. We have no evidence to indicate that the numbers in each occurrence are increasing; therefore, monitoring programs for existing populations should be developed and implemented.

Factors B, C, and D are not considered relevant for *Eriodictyon altissimum*.

## II.C. Updated Information and Current Species Status

Abundance, distribution, and life history:

There is no new information concerning the life history of the species. No focused surveys or monitoring of extant occurrences have been conducted since the time of listing, although an extension of the known occurrence at Indian Knob was reported by Oyler in 1991 (CNDDDB 2006). While we do not have definite information indicating that the existing occurrences of *Eriodictyon altissimum* are increasing, stable, or decreasing as compared to their respective status in 1994, anecdotal observations indicate that they are stable.

**II.C.2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms):**

**II.C.2.a. Present or threatened destruction, modification or curtailment of its habitat or range:**

At the time of listing, loss of habitat due to development, surface mining, and oil well drilling was identified as the primary threat to *Eriodictyon altissimum*. Since the time of listing, the threat of habitat loss due to development in the Los Osos area and surface mining, and oil well drilling in and around Indian Knob has been reduced to the point that we no longer consider this to be a significant threat to the species. The populations outside of Montaña de Oro State Park, with the exception of element occurrence 1 (Broderson), are now protected. Element occurrences 4 and 6 now are found within a Department ecological reserve and the majority of the plants in occurrence 5 (Indian Knob) are protected under a conservation easement held by the City of San Luis Obispo.

Modification of habitat due to the spread of invasive, non-native plant species was also a concern at the time of listing. Absent site-specific information from the implementation of management and monitoring programs, it is difficult to determine the actual severity of invasive, non-native species (also see discussion in Factor E).

As stated above, since the time of listing, three additional element occurrences (4, 5, and 6) are now conserved (*i.e.*, protected from development and surface mining/oil exploration) due to their location in the Morro Dunes Ecological Reserve or on lands under conservation easement on Guidetti Ranch at Indian Knob. The status of element occurrence 1 is unclear since the biological opinion under which it would have been conserved is no longer valid, having lost its federal nexus.

While there is currently no management plan that specifically addresses *Eriodictyon altissimum* on state park lands at Montaña de Oro (element occurrences 2 and 3), CDPR is currently working with the Service and the California Department of Fish and Game to develop a Habitat Conservation Plan (HCP) for the San Luis Obispo South Coast Division and Oceano Dunes State Vehicular Recreation Area. The HCP area includes



Montaña de Oro State Park where element occurrences 2 and 3 are found. *Eriodictyon altissimum* is included as a covered species. The draft HCP provides measures to be implemented that include restricted access, development and implementation of management and monitoring plans, control of exotic plant species, and education programs. Prescribed fire is a proposed covered activity in the draft HCP; however, there is no estimated timeframe for the completion of this document. See Table 1 below for a summary of occurrence information. It should be noted that the estimated number of individuals has not been updated or verified in recent years.

Table 1: Summary of status of *Eriodictyon altissimum* populations

CNDDDB ID #	Location	Manager/Owner	Conservation Status	Estimated Individuals	Reference
1	Broderson	Los Osos Community Services District	Set aside for conservation in 2004; current status unclear	30	CNDDDB 2008 CNDDDB 2008
2	Hazard Canyon	State Parks, Montaña de Oro	Habitat protected; no active management	40	CNDDDB 2008
3	Hazard Canyon	State Parks, Montaña de Oro	Habitat protected; no active management	7	CNDDDB 2008
4	Morro Dunes Ecological Reserve	California Department of Fish and Game	Habitat protected; no active management	30	CNDDDB 2008 Vanderwier 2005
5	Indian Knob	Guidetti and other private	The majority of individuals protected by conservation easement held by City of San Luis Obispo	350+	CNDDDB 2008 Vanderwier 2006
6	Morro Dunes Ecological Reserve	California Department of Fish and Game	Habitat protected; no active management	50	CNDDDB 2008

**II.C.2.b. Overutilization for commercial, recreational, scientific, or educational purposes:**

Overutilization was not identified as a factor at the time of listing, and is not currently known to be a factor.

**II.C.2.c. Disease or predation:**

Disease or predation were not identified as factors at the time of listing, and are not currently known to be factors.

**II.C.2.d. Inadequacy of existing regulatory mechanisms:**

Inadequacy of existing regulatory mechanisms was not identified as a factor at the time of listing, and is not currently known to be a factor. *Eriodictyon altissimum* does receive some protection as a listed species under California law.

### **II.C.2.e. Other natural or manmade factors affecting its continued existence:**

As discussed in the listing rule, threats to *Eriodictyon altissimum* included loss of habitat from development, surface mining, and oil well drilling (discussed in Factor A) and, to a lesser extent, competition from non-native invasive plant species. With the exception of those plants found offsite of Guidetti Ranch in the vicinity of Indian Knob (*i.e.*, element occurrence 5), all extant individuals are now secure from the threat of habitat loss due to development, surface mining, or drilling.

#### Competition with Non-native Species

No management plans or monitoring programs have been developed and implemented to detect change on conserved lands. Absent the type of information that would be collected and analyzed as part of such programs, it is not possible for us to determine if the occurrences are being adversely affected by competition from non-native invasive plant species. It does appear from anecdotal observations that all occurrences (except element occurrence 1) are stable and have not been significantly affected by competition from non-native invasive plant species. At element occurrence 1, veldt grass (*Ehrharta calycina*) appears to be degrading habitat, but its effect on *Eriodictyon altissimum* is unknown.

#### Stochastic Extinction

At the time of listing, we did not discuss stochastic extinction as a threat. The conservation biology literature commonly notes the vulnerability of taxa known from one or very few locations and/or from small and highly variable populations (e.g., Shaffer 1981, 1987; Primack 2006; Groom et al. 2006). In particular, although the plants are long-lived, the small sizes of all but the Indian Knob population may make it difficult for those populations to persist if conditions are not suitable for the establishment of new individuals.

#### Climate Change

Current climate change predictions for terrestrial areas in the northern hemisphere indicate warmer air temperatures, more intense precipitation events, and increased summer continental drying (Field et al. 1999, Cayan et al. 2005, IPCC 2007). Recently, the potential impacts of climate change on the flora of California were discussed by Loarie et al. (2008). Based on modeling, they predicted that species' distributions will shift in response to climate change and that the species will "move" or disperse to higher elevations and northward, depending on the ability of each species to do so.

Increases in species diversity in these higher elevations and northern locations due to climate change have the potential to result "...in new species mixes, with consequent novel patterns of competition and other biotic interactions..." with unknown

consequences to the species which currently exist there (Loarie et al. 2008). While, we lack adequate information to make specific and accurate predictions regarding how climate change, in combination with other factors such as small population size, will affect *Eriodictyon altissimum*; small ranged species, such as *E. altissimum*, are more vulnerable to extinction due to these changing conditions (Loarie et al. 2008).

## **II.D. Synthesis**

The current status of *Eriodictyon altissimum* does not appear to be markedly different from that summarized in the 1994 final listing rule and final recovery plan completed in 1998.

Absent the results of long-term monitoring or research, anecdotal observations indicate that the occurrences of *Eriodictyon altissimum* are self-sustaining and stable. While its habitat in Los Osos continues to be degraded by the incursion of invasive non-native plant species (particularly veldt grass) and proximity to urban development, similar anecdotal information indicates that *Eriodictyon altissimum*, as a perennial shrub species, is not being adversely affected in a substantial way. Invasive non-native plants do not appear to be an issue for the occurrence in the vicinity of Indian Knob (Vanderwier, personal observations 1980, 2006).

The focal issue for this species appears to be its need for some form of disturbance to regenerate and revitalize populations. While the species appears to respond to light and occasional anthropogenic disturbance (*e.g.*, clearing of utility roads) by seedling germination or increased rhizomatous activity, it is most likely that fire is the natural disturbance agent. Due to the proximity of those populations off of state park lands at Montaña de Oro (*i.e.*, element occurrences 1 and 4-6) and fire suppression activities in areas of urban interface, the development of climax, closed canopy chaparral appears to be adversely affecting *Eriodictyon altissimum* by precluding expansion into otherwise suitable habitat and maintenance of even-aged, eventually senescing stands.

Although anecdotal observations indicate that lack of regeneration may present a significant impediment to the recovery of *Eriodictyon altissimum*, the removal of the threat of development has removed the danger of extinction throughout all or a significant portion of its range. The species now better meets the definition of threatened: likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

## **III. RESULTS**

### **III.A. Recommended Classification**

  X   Downlist to Threatened  
       Uplist to Endangered

\_\_\_\_\_ **Delist**  
\_\_\_\_\_ **No change is needed**

### **III.B. New Recovery Priority Number: 8**

This denotes a full species with a moderate degree of threat and a high potential for recovery. This change in recovery priority number from the previous 2C is based on the elimination of the threat of development which was the source of the original potential conflict.

## **IV. RECOMMENDATIONS FOR FUTURE ACTIONS**

Using the existing recovery criteria, we would not be able to recommend that *Eriodictyon altissimum* be downlisted from endangered to threatened because recovery criteria 2 and 3 have not been achieved. However, given that the most significant of identified threats (*i.e.*, habitat loss from development or mining) have been alleviated, we now believe that the prospect for long-term persistence of the species has improved such that it is no longer in danger of extinction throughout all or a significant portion of its range. Even if downlisted to threatened, the following will still be needed in order to develop delisting criteria:

1. The recovery plan prepared for Morro shoulderband snail (*Helminthoglypta walkeriana*) and four other plants species should be revised to specifically address what is believed to be needed for the recovery of *Eriodictyon altissimum*. Currently, recovery actions seem to focus primarily on the habitat for Morro shoulderband snail, Morro manzanita (*Arctostaphylos morroensis*), Pismo clarkia (*Clarkia speciosa* ssp. *immaculata*) and Chorro Creek bog thistle (*Cirsium fontinale* var. *obispoensis*). *Eriodictyon altissimum* should be the subject of its own recovery plan or individual recovery or conservation planning units should be identified for this species within the existing recovery plan. The population of *Eriodictyon altissimum* at Indian Knob should be factored more prominently into the recovery goals for the species.
2. Specific recovery goals should be determined for each recovery unit and based upon the results of research, monitoring, and management activities. The incorporation of such revisions would allow for the development of delisting criteria.
3. Monitoring programs to determine the number and population trends for *Eriodictyon altissimum* should be developed and implemented.

## **V. REFERENCES**

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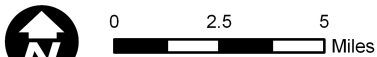
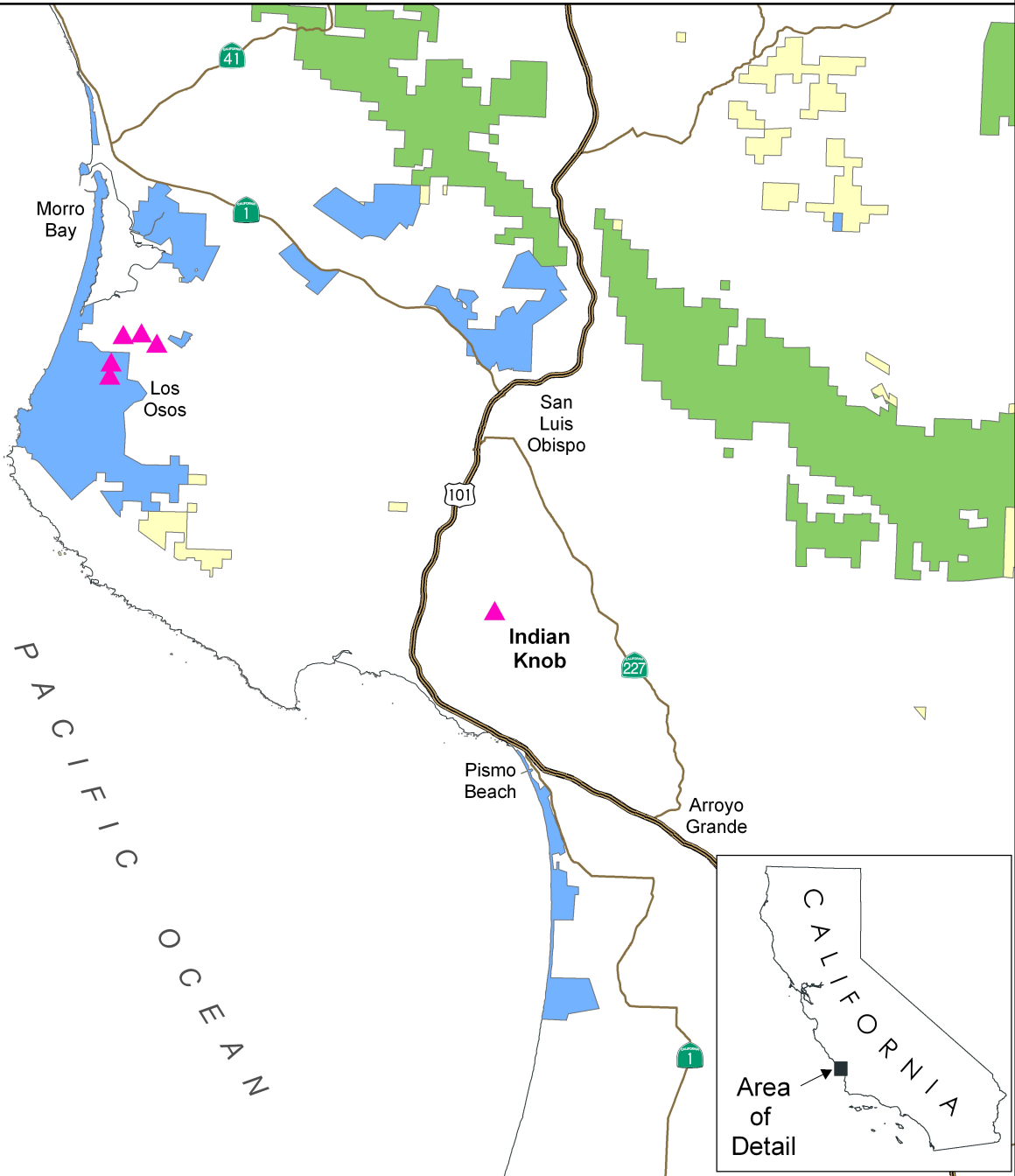
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**Personal Communications:**

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Figure 1. Distribution of *Eriodictyon altissimum* (Indian Knob Mountainbalm)



▲ Indian Knob Mountainbalm Records (CNDDb, 2008)

—/— Roads / Highways

Land Ownership

- Los Padres National Forest
- BLM Administered Lands
- State Lands



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

*Eriodictyon altissimum* (Indian Knob mountainbalm)

**Current Classification:** Endangered

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

Downlist to Threatened

Uplist to Endangered

Delist

No change is needed

**Appropriate Listing/Reclassification Priority Number:** 6 (This action indicates a species with low management impact and a non-petitioned action.)

**Review Conducted By:** Julie M. Vanderwier

**FIELD OFFICE APPROVAL:**

Field Supervisor, Fish and Wildlife Service

Approve Diane K. Volo Date 1/14/09

**REGIONAL OFFICE APPROVAL:**

Assistant Regional Director, Fish and Wildlife Service

Approve M. J. F. Z. i. Date 2-4-09