U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Eriogonum corymbosum* var. *nilesii*

COMMON NAME: Las Vegas buckwheat

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X_ Petitioned - Date petition received: April 23, 2008
X 90-day positive - FR date: December 10, 2008
X 12-month warranted but precluded - FR date: December 10, 2008
__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.
Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

___ Listing priority change
Former LP: ___
New LP: ___

Date when the species first became a Candidate (as currently defined): December 6, 2007

___ Candidate removal: Former LPN: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: General Group: Flowering Plants, Scientific Group: Polygonaceae (Buckwheat Family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Nevada

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Nevada, Clark County

LAND OWNERSHIP: Based on 1,012 acres of known, currently occupied habitat, ownership totals 88 percent on public lands (522.1 acres Bureau of Land Management [BLM], 370 acres Department of Defense [DOD]) and 12 percent on private lands (120 acres).

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LEAD FIELD OFFICE CONTACT: Brian A. Novosak, (702) 515-5230, Nevada Fish and Wildlife Office, Las Vegas, Nevada; email: Brian_Novosak@fws.gov

BIOLOGICAL INFORMATION

Species Description

Eriogonum corymbosum var. *nilesii* is a woody perennial shrub up to 4 feet high with a mounding shape. The variety is distinguished from closely related taxa by leaves that are densely hairy on one or both surfaces, at least twice as long as wide, with dense hairs spread along the stem. The branches are wooly haired and swollen at branch intersections. The inflorescences are 1 – 4 inches long with the flowers arranged in umbrella-like clusters (corymbs) at the end of branches. The inflorescence branches are divaricate, rigid, and sometimes spinescent. The numerous flowers are small and yellow with small bract like leaves at the base of each flower. This plant is very conspicuous when flowering in late September and early October.

Photo Credit: Gina Glenne, USFWS

Taxonomy

The taxonomic classification of *Eriogonum corymbosum* var. *nilesii* has an intricate history of name changes and revisions (*e.g.*, Reveal 1967, 1971, 1980a, 1980b, 1983, 1985a, 1985b, 2002, and 2004). *E. corymbosum* var. *nilesii* is part of the *Corymbosum* complex, which is widespread in the southwest and concentrated on the Colorado Plateau (Reveal 2002, pp. 26-37; Reveal 2004, p. 129). Based on morphology, *E. corymbosum* var. *nilesii* is probably most closely related to *E. corymbosum* var. *glutinosum* (Reveal 2002, pp. 32-33; Reveal 2004, p. 129). *E. corymbosum* var. *nilesii* has traditionally been assigned to the Colorado Plateau variant *E. corymbosum* var. *glutinosum* but differs from *glutinosum* in its dense, white tomentose (hairy) leaves, disjunct distribution, and preference for gypsum soils (Reveal 2002, p. 26). Based on morphometric studies, Reveal (2004, p. 129) determined material from Clark County, Nevada, represented a unique taxon and named this variety *nilesii*. The validity of Reveal's morphological determination was confirmed by Ellis and Wolf (2007, pp. 1-14) using molecular genetic analysis. After review of the available taxonomic data we conclude that *E. corymbosum* var. *nilesii* is a valid taxon that meets the definition of a "species" under the Endangered Species Act (Act).

Habitat/Life History

Plants of the *Corymbosum* complex are common in sandy substrates on the Colorado Plateau from southwestern Wyoming through western Colorado, eastern Utah, northern New Mexico, and Arizona. Within this complex, Meyer (1986, p. 1308) and Reveal (2002, p. 26) claim a key feature for considering *Eriogonum corymbosum* var. *nilesii* a distinct variety is its preference for gypsum soils. It is also important to understand the influence of site characteristics such as topographic relief, soil particle size, soil depth, as well as soil chemistry (Dorhan and Merkler 2009, pp. 4-6) on habitat preference. Using soil test pits, Drohan and Buck (2006, p. 12) determined *E. corymbosum* var. *nilesii* typically occurs on deeper soils than *Arctomecon californica* (Las Vegas bearpoppy) an endemic gypsovag (a species that can occur on soil with or without gypsum) that shares much of the same habitat preferences and range. Research in Clark County (Clark County 2009b, pp. 8-9, 31-32) is ongoing to further refine substrates and soil types suitable for *E. corymbosum* var. *nilesii*, but Drohan and Merkler (2009, pp. 4-6) suggest slopes from 0 to 3 percent, soils with low sand content and high silt content, larger soil particle size, and a soil chemistry with higher amounts of magnesium, sodium, potassium, chloride, and boron also influence habitat preference. Typically, gypsum soil outcroppings occupied by *E. corymbosum* var. *nilesii* are sparsely vegetated with bare exposed soils covered with a cryptogamic soil crust, living soil composed of an association between algae, lichen, mosses, and fungi. Although a specific vegetation classification for *E. corymbosum* var. *nilesii* habitat does not exist, it generally can be differentiated from typical Mojave creosote-bursage scrub and saltbush scrub that usually surrounds it by the presence of gypsophiles (gypsum obligate species) and other gypsoclines (species that occur primarily on gypsum soils) that occasionally share habitat, including *Petalonyx parryi* (Parry sandpaper plant), *Phacelia palmeri* (Palmer's phacelia), *Mentzelia pterosperma* (wingseed blazing star) and *Camissonia multijuga* (froststem suncup) (Meyer 1986, p. 1308).

Historical Range/Distribution

Because the taxonomy of *Eriogonum corymbosum* var. *nilesii* was only resolved in 2006, there is little information regarding historical range and distribution. Based on herbarium records, *E. corymbosum* var. *nilesii* is historically known from three locations in Clark County: Las Vegas Valley, Gold Butte, and Muddy Mountains (Service 2000, p. 9), and the Las Vegas Valley historically contained the primary distribution of the variety. Using U.S. Geological Survey soils mapping, we estimate there were 88,000 acres of potentially suitable soils for the variety in the Las Vegas Valley (Figure 1). However, this is likely an overestimate of the historical occurrence of the variety within the Las Vegas Valley because additional biotic and abiotic factors that regulate recruitment and reproduction (including pollination biology, seed dispersal, topographic relief, soil particle size, soil depth, soil chemistry, and local hydrology) may have limited its distribution within potentially suitable soils.

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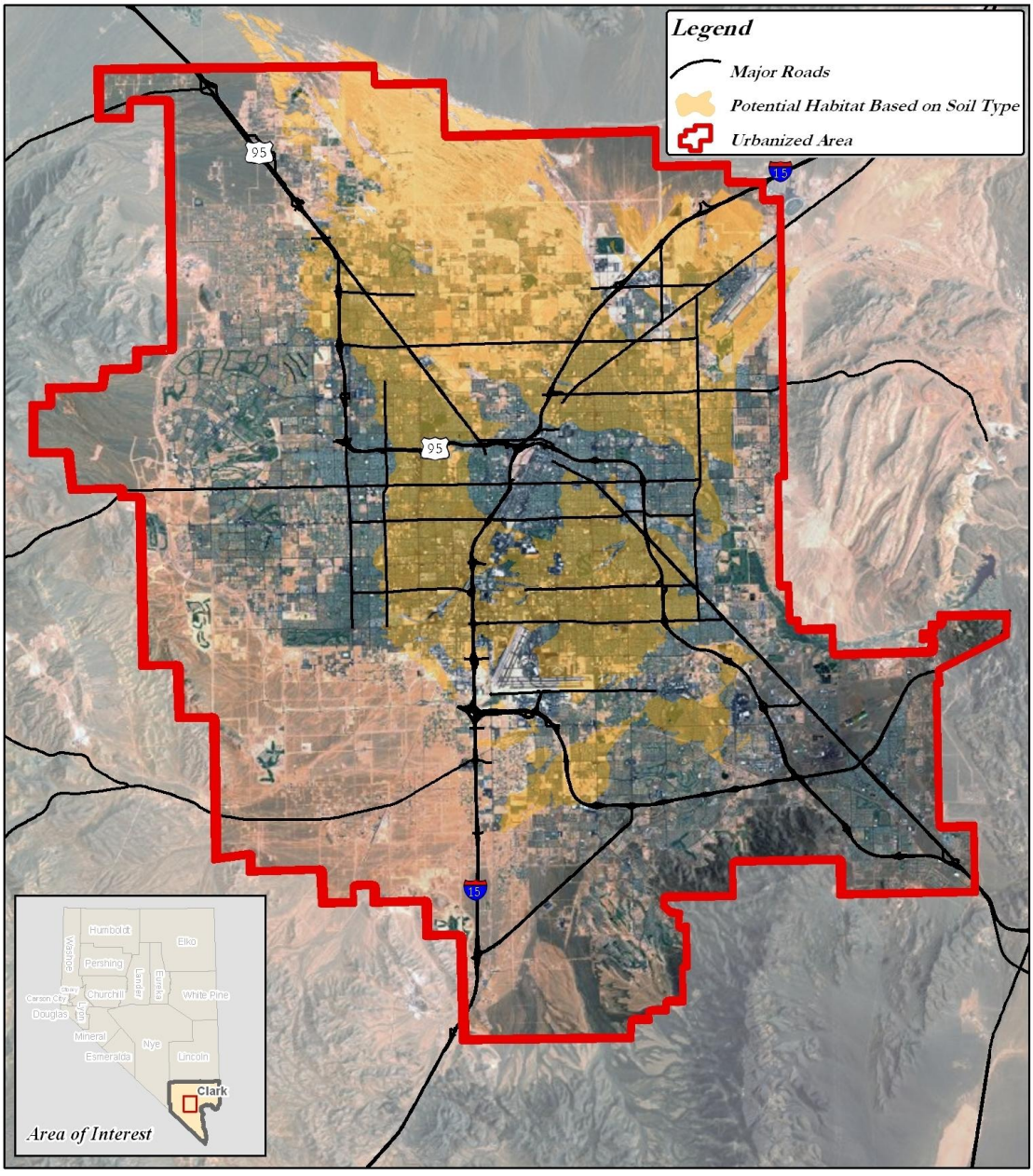
Las Vegas Valley
Clark County

Figure 1. **Potential Historical Habitat Based on Soil Mapping and Records for *Eriogonum corymbosum* var.*nilesii* in the Las Vegas Valley**



PRODUCED BY THE NEVADA FISH & WILDLIFE OFFICE
LAS VEGAS, NEVADA
LAND STATUS CURRENT TO: 01/09/2010
MAP DATE: 03/10/2010
BASEMAP: ESRI World Imagery 2007
MERIDIAN: N/A
FILE:Y:\GISData\Projects\CNOR_2010_LV_Buckwheat\Maps\Pot_historic_hab.mxd

0 2 4 8 Miles

0 2 4 8 Kilometers

UTM ZONE 11
NAD 83

Current Range/Distribution

Using morphometrics, Reveal (2002, p. 26; 2004, p. 129) described the range of *Eriogonum corymbosum* var. *nilesii* as southern Lincoln and Clark Counties, Nevada; the Paria River in southern Kane County, Utah; and Pierce Wash, in northern Mohave County, Arizona. Data from Ellis and Wolf (2007, p. 13) suggest populations in the eastern portion of the range may have a higher similarity to *E. corymbosum* var. *aureum* than the Las Vegas Valley population; therefore, populations in Utah and Arizona could represent transitional forms between the variety *nilesii* and variety *aureum*. Using existing herbarium records to determine the range of *E. corymbosum* var. *nilesii* is problematic because information on important habitat features such as the presence of gypsum soils is generally unavailable. Until additional genetics work is completed and site-specific habitat information is collected on the Utah and Arizona herbarium records, we conclude the current range of the variety is limited to Clark County, Nevada. Of the 67 acres of privately owned parcels in the Las Vegas Valley that contained occupied *E. corymbosum* var. *nilesii* habitat in 1999, 96 percent has been developed and about 70 percent of the total historical population has been extirpated due to development (Nevada Natural Heritage Program [NNHP] 2007, p. 1). Presently, *E. corymbosum* var. *nilesii* is known from seven occurrences on less than 1,100 total acres (Table 1 and Figure 2).

At this time, we are unable to determine whether or not additional sites and subpopulations would be found in Nevada if more extensive surveys are conducted. Clark County (Clark County 2009b, pp. 8-9, 31-32) is developing a predictive model to identify potentially suitable habitats for *Eriogonum corymbosum* var. *nilesii*, conducting field evaluations, and collecting additional soil samples. When complete, this model will provide additional insight into areas to target for future surveys.

Population Estimates/Status

Incomplete survey data have made estimating the total number of extant individual plants within the entire range of the variety difficult; however, the total historical population is estimated to have been 47,375 individuals (Nevada Division of Forestry [NDF] 2007, p. 1) and we estimate that currently there are no less than 13,566 plants total in seven occurrences (Table 1 and Figure 2). These seven occurrences each contain from one to three sites with plants. Although Ellis and Wolf (2007, p. 13) suggest that many of these occurrences were likely contiguous in the past and should be considered a single population, we consider each occurrence to be a subpopulation given the distances and barriers between them. Isolated undeveloped private parcels in the Las Vegas Valley have been combined into one occurrence based on their management status for discussion purposes. We currently do not have information as to the biological and reproductive status of each individual subpopulation. Land management and conservation status differ among and within occurrences and only 12 percent of the known population is fully conserved (Table 1).

Table 1: Known subpopulations and habitat conservation status of *Eriogonum corymbosum* var. *nilesii* in Clark County, Nevada

Occurrence / Subpopulation in Clark County	Site Name	Land Owner	Estimated Number of Individuals	Occupied Habitat (acres)		Habitat Conservation Status and Threats
				Acres	% of total	
Upper Las Vegas Wash, Las Vegas Valley	Eglington Preserve	BLM	300	59	5.83	Conserved
	Park Highlands	Private	1,300	92	9.09	Not conserved
	Conservation Transfer Area (CTA)	BLM	5,200	125	12.35	Likely conserved
Nellis Air Force Base (AFB), Las Vegas Valley	Nellis AFB Area III (1)	DOD	unknown	233	23.02	Likely conserved
	Nellis AFB Area III (2)	DOD	unknown	137	13.54	Likely conserved
Isolated undeveloped private parcels in Las Vegas Valley (7)	Las Vegas Valley (Private)	Private	unknown	3	0.30	Not conserved
Tropicana/Decatur Parcel, Las Vegas Valley	Tropicana/ Decatur	BLM	366	4.6	0.45	Not conserved
				10	0.99	Conserved
Coyote Springs Valley	Coyote Springs (1)	BLM	unknown	62	6.13	Not conserved
	Coyote Springs (2)	Private	unknown	25	2.47	Not conserved
Gold Butte	Gold Butte	BLM	100	7.5	0.74	Not conserved
Muddy Mountains, White Basin	Muddy Mountains	BLM	unknown	52	5.14	Conserved
	White Basin (1)	BLM	unknown	30	2.96	Not conserved
	White Basin (2)	BLM	6,300	172	16.99	Not conserved
TOTAL			**13,566+**	**1,012.1**	**100.00**	

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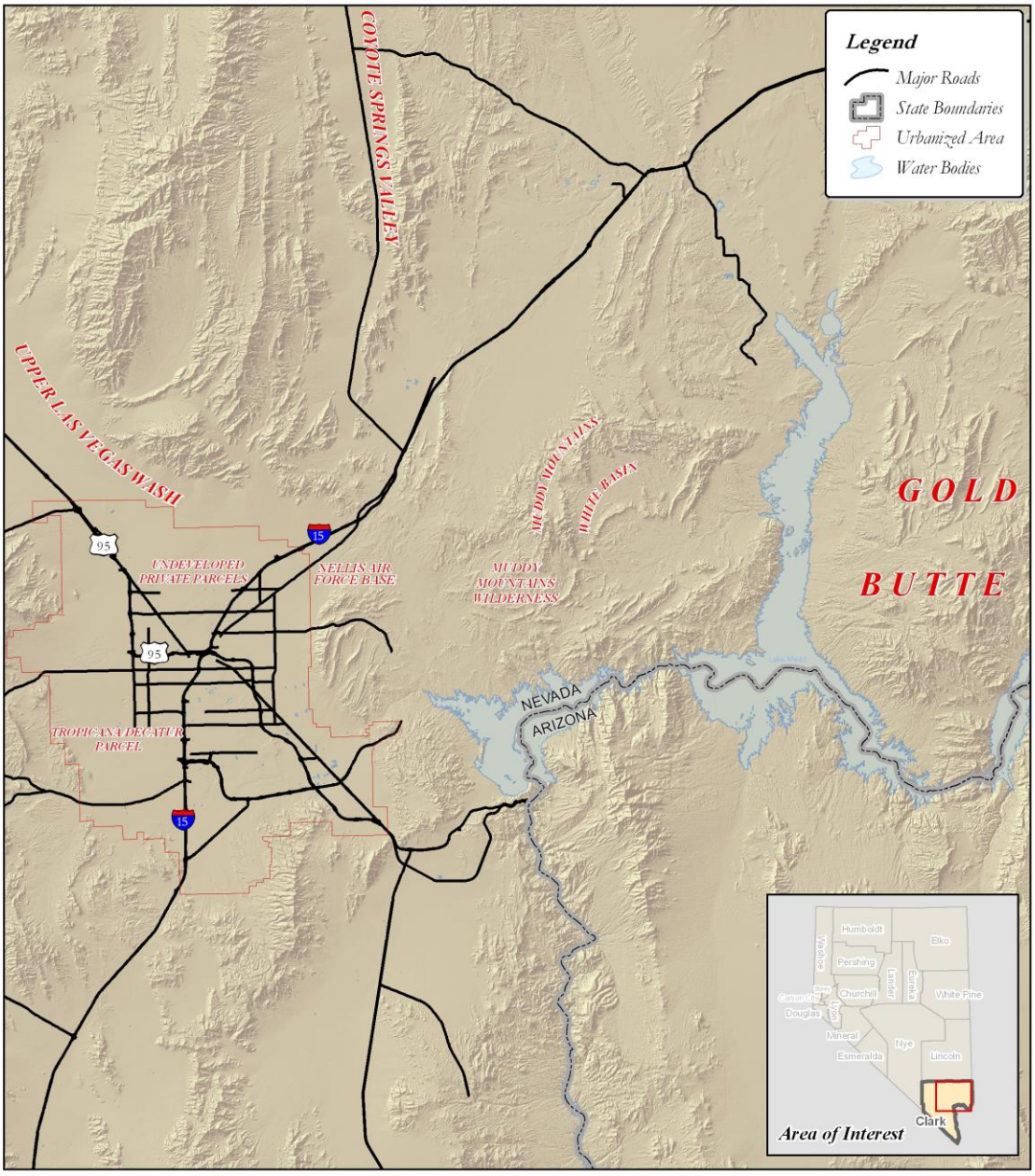
Las Vegas Valley
Clark County

Figure 2. **Subpopulation locations of *Eriogonum corymbosum* var. *nilesii* in Southern Nevada**



PRODUCED BY THE NEVADA FISH & WILDLIFE OFFICE
LAS VEGAS, NEVADA
LAND STATUS CURRENT TO: 01/09/2010
MAP DATE: 03/12/2010
BASEMAP: 10M State DEMs
MERIDIAN: N/A
FILE:Y:\GISData\Projects\CNIOR_2010_LV_Buckwheat\Maps\Geog_dist_bwu.mxd

0 4 8 16 Miles
0 4 8 16 Kilometers

UTM ZONE 11
NAD 83

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Urban Development

Clark County, Nevada, has been one of the fastest growing counties in the United States. The population more than doubled from 1990 to 2006, from 797,142 to 1.92 million. Today, the population of Clark County is approximately 2 million people (Clark County 2009a, p. 1). Human population growth and urban development in Las Vegas has resulted in the loss of over 95 percent of the potential historical habitat of *Eriogonum corymbosum* var. *nilesii* in the Las Vegas Valley (Figure 1). Most of the remaining habitat is scheduled to be developed through approved housing and infrastructure projects (Table 1). These include:

- Ninety-two acres of the Upper Las Vegas Wash population. The Park Highlands housing development was approved during negotiations for a conservation agreement among the Service, BLM, NDF, and the City of North Las Vegas (see discussion under Conservation Measures Planned or Implemented);

- Three acres of isolated undeveloped private parcels in the Las Vegas Valley (Service 2010, p. 1); and

- Twenty-five acres of private land within the Coyote Springs Investment, L.L.C., project footprint.

Surface Mining and Mineral Claims

Potential surface mining and mineral claims are a threat to some occurrences of *Eriogonum corymbosum* var. *nilesii* on some BLM-managed lands. Gypsum soil outcroppings on which *E. corymbosum* var. *nilesii* occurs can yield gypsum, a saleable mineral with commercial value. Future mineral extraction is a threat to the remaining habitat in the Muddy Mountains, White Basin subpopulation at the White Basin (2) site. Locatable and solid leasable minerals were completely withdrawn from two occurrences of *E. corymbosum* var. *nilesii*: Coyote Springs Valley (Coyote Springs (1)) and Gold Butte; and 30 acres of the White Basin (1) in the Muddy Mountains, White Basin subpopulation (see discussion under Conservation Measures Planned or Implemented). Portions of the Muddy Mountains, White Basin subpopulation within the Muddy Mountains Wilderness are protected from mineral withdrawal by congressional action concurrent with wilderness designation. Finally, given the urban setting, it is unlikely mineral claims will be made on BLM-managed lands within the Tropicana/Decatur or Upper Las Vegas Wash subpopulations. Mining and mineral claims are not a threat on private lands or DOD lands.

Recreation

Demand for recreational opportunities is increasing with Clark County's population growth. Off-highway vehicle (OHV) activity accounts for the single greatest recreational use of public lands within Clark County (Clark County 2000, Chapter 4, p. 70). A 2006 threats analysis for the Clark County Rare Plant Conservation Management Strategy (CMS) also described casual OHV use and the creation of new trails as significant threats for all rare plant species on BLM-managed lands (TNC 2007, pp. 44, 62, 80, 91, 103, 120, 132, 145, 157). Based on habitat observations made by the Service (Service 2007, pp. 1-21), approximately 95 percent of the total known remaining habitat is used for public recreation (including OHV activity, equestrian activity, and other recreation): Eglington Preserve, CTA, Nellis Air Force Base (AFB) Area III (1), Tropicana/Decatur, Gold Butte, White Basin (1 and 2), and Coyote Springs (1). Only the portion of the Muddy Mountains, White Basin subpopulation within the Muddy Mountains Wilderness is completely protected from public recreation. Approximately half of the remaining the habitat for *Eriogonum corymbosum* var. *nilesii* is adjacent to or within urban areas in the Las Vegas Valley and degradation is already evident on these sites (Service 2007, pp. 1-21). Sites sustaining the highest resource damage include: Nellis AFB Area III (1), Eglington Preserve, CTA, and Tropicana/Decatur (Figure 2).

The impact of public recreation on *Eriogonum corymbosum* var. *nilesii* habitat needs further investigation, but impacts to the desert from OHV use are well documented (e.g., Webb and Wilshire 1983, pp. 1-534). These impacts include destruction of natural soil stabilizers (cryptogammic soil crusts), soil compaction, reduced rates of water infiltration, increased wind and water erosion, and destruction of vegetation (Lovich and Bainbridge 1999, pp. 315-316). Compaction of desert soil reduces root growth of desert plants and makes it much harder for seedlings to survive (Bainbridge and Virginia 1990, pp. 3-13). Natural recovery of the desert is slow because of extreme temperatures, intense sun, high winds, limited moisture, and low fertility of desert soils (Bainbridge and Virginia 1990, pp. 3-13). Conditions suitable for plant establishment occur only infrequently or irregularly, and it may take 50 – 300 years for recovery from anthropogenic impacts (Lovich and Bainbridge 1999, p. 309). While impacts associated with public recreation within *E. corymbosum* var. *nilesii* habitat are serious, the severity of these impacts are typically much lower than urban development and surface mining, which permanently remove or irretrievably alter large expanses of habitat so that it can no longer support the plant.

The Nellis AFB Area III (1) site is adjacent to military family housing and a horseback-riding stable, and in 2007, equestrian riders and newly created trails were observed within *Eriogonum corymbosum* var. *nilesii* habitat (Service 2007, pp. 3, 10-13). Recreational use of Nellis AFB Area III (1) by DOD personnel continues to be a threat to *E. corymbosum* var. *nilesii* and is expected to continue because accessible open spaces within and adjacent to the base are extremely limited.

Sites within the Upper Las Vegas Wash subpopulation, including the CTA and Eglington Preserve, are bisected by a buried water pipeline, electric transmission line corridor, and

associated maintenance access roads. Recreationists use the maintenance roads to access these areas and have destroyed *Eriogonum corymbosum* var. *nilesii* plants and contributed to further habitat degradation (Service 2007, p. 3, 7-9) through development of an extensive network of new user-created roads and trails throughout these sites.

The Tropicana/Decatur subpopulation occurs on BLM lands surrounded by urban development. Clark County holds a Recreation and Public Purpose (R&PP) lease (BLM case number N-78796) on the entire 80-acre parcel and an easement for a flood control detention basin (BLM case number N-55083) covering approximately one-third of the parcel. This site has sustained the heaviest resource damage, including extensive OHV damage (Service 2007, pp. 4, 18-19). The site was likely used for motocross events in the 1980's and 1990's. Transients have occupied the site, living in makeshift shelters and caves excavated into bluffs within *Eriogonum corymbosum* var. *nilesii* habitat (Service 2007, p. 4; BLM 2007a, pp. 1-16). In fall 2007, Las Vegas Metro Police cleared the majority of the vegetation within the wash to improve public safety and prevent re-establishment of transient use of the area (BLM 2007a, p. 1); however, transients continue to occupy the site. *E. corymbosum* var. *nilesii* plants within the wash were avoided.

Outside the Las Vegas Valley, habitat within the White Basin (1 and 2) and Gold Butte sites are at risk of damage from recreational use because both areas are within multiple-use lands that are open to OHV activity. In the past, BLM has permitted off-road races in the White Basin (1 and 2) area. When the approved community of 150,000 homes is developed at the Coyote Springs (1) site, *Eriogonum corymbosum* var. *nilesii* will be at increased risk of OHV impacts because of the increased human presence and activity. Although BLM is required to regulate recreational use of the adjacent public lands, use is expected to increase as development proceeds.

Wildfire

Historically, fire in the Mojave Desert has been an infrequent and rare event. However, there has been a recent increase in fire prevalence caused by the invasion of non-native annual grasses, which is a major concern for federal land managers (Brooks and Matchett 2006, p. 148). Additionally, human activities in the Mojave Desert have increased both fire frequency and the size of individual fires (Brooks and Matchett 2006, pp. 148-164). Although we have little specific information regarding the potential for *E. corymbosum* var. *nilesii* to burn, over 1,000,000 acres burned in the Mojave Desert in 2005 and 2006, mostly fueled by invasive, non-native grasses (Service 2008, p. 28).

While none of the 2005 fires burned in *Eriogonum corymbosum* var. *nilesii* habitat, fires ignited in creosote-bursage vegetation outside of *E. corymbosum* var. *nilesii* habitat could easily spread through an entire subpopulation or site. In a 2007 fire risk assessment using many factors including the presence of fine materials such as red brome and cheat grass, BLM categorized the Coyote Springs (1) site and Gold Butte subpopulation at moderate risk; and the White Basin (1), Muddy Mountains Wilderness, CTA, and Eglington Preserve sites are a low to moderate risk (Rash 2007, p. 1).

Woody shrubs (like *Eriogonum corymbosum* var. *nilesii*) and cacti are often killed by fire and those that survive are vulnerable to recurrent fire (Brooks and Pyke 2001, p. 7). Post-fire survival of *E. corymbosum* var. *nilesii* is unknown; however, like many perennial desert plant species, individual plants are extremely slow growing, long-lived, and not specifically adapted to fire; and therefore, post-fire recovery could take decades. An increased fire frequency would likely negatively affect *E. corymbosum* var. *nilesii* by not allowing a sufficient interval of time for recruitment and reproduction of new individuals to replace those lost during fires. It is unlikely that a single fire would threaten the entire range; however, it is possible that a series of fires over a period of years could threaten the variety over a significant portion of its habitat.

Non-native species

Two non-native species are present at high densities in disturbed areas within two *Eriogonum corymbosum* var. *nilesii* sites. Within the CTA, *Halogeton glomeratus* (saltlover) has colonized disturbed soils; while at Nellis Area III (1) *Malcolmia africana* (African mustard) is common along the southern boundary of the site (Service 2007, p. 3). Invasive species can out-compete native annual and perennial plants for water and soil nutrients and densely packed stands of invasive annual plants can reduce germination rates of native plant seeds (Brooks and Pyke 2001, p. 6). We do not have information in our files to indicate these species adversely affect *E. corymbosum* var. *nilesii* recruitment and establishment, nor do we have sufficient information to evaluate the general threats non-native species pose. However, given the seriousness and magnitude of this threat for the Mojave Desert ecosystem, we believe this threat to the variety should be carefully monitored.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

We are unaware of any use of *Eriogonum corymbosum* var. *nilesii* for commercial purposes as this variety does not have any known commercial value. We are unaware of any scientific or recreational collection, and although some may be occurring, it is unlikely to be having a negative impact on the whole population. We are unaware of any use of *E. corymbosum* var. *nilesii* for educational purposes.

C. Disease or predation.

There are no known diseases or predation affecting *Eriogonum corymbosum* var. *nilesii*.

D. The inadequacy of existing regulatory mechanisms.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires Federal agencies to describe a proposed action, consider alternatives, identify and disclose potential environmental impacts of each alternative, and involve the public in the decision making process. The release of documents is for disclosure, and NEPA does not require or guide mitigation for project impacts. Projects that are covered by certain "categorical exclusions" are exempt from NEPA biological evaluations.

Both BLM and DOD comply with NEPA for actions requiring an environmental assessment, including many projects in or near *Eriogonum corymbosum* var. *nilesii* habitat. Federal agencies are not required to select the NEPA alternative having the least significant environmental impacts. A Federal agency may select an action that will adversely affect sensitive species provided that these effects were known and identified in a NEPA document.

Bureau of Land Management

In 1976, Congress passed the Federal Land Policy Management Act (FLPMA) to direct the management of the public lands of the U.S. Under FLPMA, the BLM is required to draft, implement, and revise, when necessary, land use and resource management plans. The 1998 BLM Las Vegas District Resource Management Plan (RMP) includes provisions limiting OHV activity to designated roads, trails, and dry washes. The Clark County Rare Plant CMS identified conservation measures from the RMP, including closing illegal roads and trails and enforcement of OHV regulations as means of improving rare plant conservation on public lands. Nationwide, enforcement of OHV restrictions on federal land is limited with only a few resource law enforcement officers (Gregory 2008, pp. 1-12). On BLM-managed lands under the jurisdiction of the Southern Nevada District Office outside of the Red Rock Canyon National Conservation Area, there is roughly 1 officer for every 370,200 acres, and several portions of the District (Moapa, Gold Butte, and Nye County) are currently limited to 1 duty officer (BLM 2007b, p. 1). The BLM's ability to regulate OHV activity in southern Nevada is not expected to improve in the near future.

Most of the remaining *Eriogonum corymbosum* var. *nilesii* habitat is managed by BLM, which has classified *E. corymbosum* var. *nilesii* as a sensitive species. Under BLM Manual 6840.06E, policy is to provide these species with the same level of protection as BLM provides for species that are candidates for listing. Under BLM Manual 6840.06C, policy states,

> "*BLM shall implement management plans that conserve candidate species and their habitat and shall ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed.*"

This policy also ensures that BLM sensitive species are included in NEPA analyses for proposed projects. As a BLM special status species, impacts to *Eriogonum corymbosum* var. *nilesii* may still occur with authorization from BLM managers.

Approximately 60 percent of the land in Clark County is managed by the BLM and congressional actions often determine disposal boundaries, utility corridors, and other specific project boundaries as desired by local government. Recent congressional actions have authorized the transfer of BLM lands out of federal management, which has affected several sensitive species including *Eriogonum corymbosum* var. *nilesii*. For instance, a 2002 amendment to the Southern Nevada Public Land Management Act (SNPLMA) and subsequent amendments authorized disposal of BLM lands in the Las Vegas Valley through public auction, many with significant populations of *E. corymbosum* var. *nilesii*. In 2005, the BLM initiated disposal of these lands,

but later initiated comprehensive planning for the CTA and developed a conservation agreement with the City of North Las Vegas that established the Eglington Preserve (see discussion under Conservation Measures Planned or Implemented).

Department of Defense

The DOD, with assistance from the Service, is responsible under the Sikes Act (16 USC 670a-670f, as amended) for implementing programs and management strategies to conserve and protect biological resources. The Sikes Act was amended in 1997 to include the development of mutually agreed upon Integrated Natural Resource Management Plans (INRMP) through voluntary cooperative agreements among the DOD installation, the Service, and respective state wildlife agency. These documents are used to guide landscape-level planning and management on DOD lands. The Final INRMP for Nellis AFB states that areas containing *Eriogonum corymbosum* var. *nilesii* would remain undeveloped unless military mission requirements dictate otherwise and the U.S. Air Force (USAF) would not allow further development for activities that are purely recreational (USAF 2010, pp. 168-171); however, the INRMP contains no specific conservation measures to protect *E. corymbosum* var. *nilesii*. Nellis AFB would consult with the Service and NDF to incorporate conservation measures for the plant if development was to occur within occupied habitat (USAF 2010, pp. 168-171).

Approximately 137 acres (23 percent) of the remaining *Eriogonum corymbosum* var. *nilesii* habitat is on Nellis AFB Area III (1). The threat to the Nellis AFB Area III (1) site was recognized in 1998 and an attempt was made to preserve the site through the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and through State regulatory mechanisms that protect *Arctomecon californica*; however, the DOD cannot permanently set aside land for conservation which would restrict land use for defense-related purposes in *E. corymbosum* var. *nilesii* habitat within Area III (USAF 2010, p. 169).

State

Eriogonum corymbosum var. *nilesii* is not protected by the State of Nevada, where regulations protecting plant species are administered by NDF under the direction of the State Forester. In 2001, 2002, 2003, and 2006, the Nevada Native Plant Society's Rare Plant Committee recommended inclusion of *E. corymbosum* var. *nilesii* on the State list of critically endangered species. The State denied the four earlier recommendations (NDF 2006, p. 2), and is currently evaluating another recommendation (NNHP 2007, pp. 1-2; NDF 2008, pp. 1-3). *E. corymbosum* var. *nilesii* and other rare plant species in Nevada are not included in any comprehensive management planning efforts for the State, such as the State of Nevada Wildlife Action Plan.

Local

There have been no ordinances or regulatory measures established by local municipalities to protect *Eriogonum corymbosum* var. *nilesii*. Under the Clark County MSHCP, *E. corymbosum* var. *nilesii* is included as a high priority evaluation species. The MSHCP defines an evaluation species as those for which additional information is required or for which sufficient management

prescriptions are unlikely to be able to be defined and implemented sufficiently to support an application for a section 10(a)1(a) permit under the Act. Status as evaluation species does not provide the plant with any regulatory protection.

E. Other natural or manmade factors affecting its continued existence.

Stochastic events

Small populations in both size (acreage) and numbers of individuals are vulnerable to stochastic effects (Shaffer 1981, p. 131; 1987, p. 72). All subpopulations of *Eriogonum corymbosum* var. *nilesii* are small in area, typically between 50 and 90 acres, with the largest at just over 200 acres. Fire in the Mojave Desert is the most likely stochastic event that could adversely affect *E. corymbosum* var. *nilesii*, as these small subpopulations are susceptible to being destroyed by a single, large fire.

Climate change

Warming trends seen over the past 50 years in the United States are predicted to continue to increase (Field *et al*. 2007, pp. 626-627); however, the magnitude varies spatially across the continent, is most pronounced during spring and winter months, and has affected daily minimum temperatures more than daily maximum temperatures (Field *et al*. 2007, p. 620). Other effects of climate change include, but are not limited to, changes in types of precipitation (Knowles *et al*. 2006, p. 4557), earlier spring run-off (Stewart *et al*. 2005, p. 1152), longer and more intense fire seasons (Bachelet *et al*. 2007, pp. 16-17), and more frequent extreme weather events (Rosenzweig *et al*. 2007, p. 109). Increasing summer and winter temperatures and decreasing precipitation regionally greater than current global models could adversely affect *Eriogonum corymbosum* var. *nilesii* by causing physiological stress and habitat loss, reducing seed germination, seedling establishment, and altering fire frequencies. At this time, it is difficult to predict local climate change impacts due to substantial uncertainty in trends of hydrological variables (e.g., natural variability can mask long-term climate trends); limitations in spatial and temporal coverage of monitoring networks; and differences in the spatial scales of global climate models and hydrological models (Bates *et al.* 2008, pp. 3, 25, 30, 135-136). Thus, while the information indicates that climate change has the potential to affect ecosystems in the Great Basin and Mojave Desert in the long-term, there is much uncertainty regarding the attributes that could be affected and/or the timing, magnitude, and rate of change as it relates to *E. corymbosum* var. *nilesii* in southern Nevada.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Since 2002, conservation measures have been completed that directly and indirectly benefit *Eriogonum corymbosum* var. *nilesii*. These measures are discussed below.

Establishment of Eglington Preserve

As discussed under Factor D – The inadequacy of existing regulatory mechanisms, a 2002 congressional action authorized disposal (sale) of the land containing the Upper Las Vegas Wash subpopulation of *Eriogonum corymbosum* var. *nilesii*. The BLM initiated comprehensive planning for the Upper Las Vegas Wash and established the Eglington Preserve. Through this agreement, the sale and development of 92 acres of occupied habitat was authorized in exchange for the preservation of 59 acres of occupied habitat within the Preserve, which is adjacent to the CTA. The 92 acres authorized for development is the Park Highlands site.

In 2006, BLM installed fencing around the Eglington Preserve to protect the site from unauthorized OHV use and illegal dumping. This fence protects roughly one-third of the Upper Las Vegas Wash subpopulation, while the remaining two-thirds (CTA and Park Highlands) continue to experience extensive OHV activity and casual recreational use (Service 2007, pp. 3, 5-6).

Fencing of Nellis AFB Area III (1) Site

In 2000, threats to the Nellis AFB Area III (1) site prompted the construction of a fence to protect the site from illegal OHV activity and dumping of construction and household debris. During a site visit on January 3, 2007, holes in the fence were observed and illegal trespassing and dumping was evident. During a site visit in April 2007, the fence was observed to be cut again and illegal dumping was continuing (Service 2007, pp. 3, 10-13). We consider this fencing project to be important to protecting *Eriogonum corymbosum* var. *nilesii*; however, recreational use of Nellis AFB Area III (1) continues to be a threat and is expected to continue because accessible open spaces within and adjacent to the base are extremely limited.

Establishment of Tropicana/Decatur Conservation Area

As part of the mitigation associated with construction of the Lower Flamingo Wash Detention Basin, Clark County, in cooperation with BLM, developed a conservation and mitigation plan (Clark County 2009c, pp. 1-3). The plan identified a 10-acre 'conservation area' and a 4.6-acre 'management area'. In March 2009, Clark County, in cooperation with BLM, translocated 277 *Eriogonum corymbosum* var. *nilesii* that would have been impacted by the project to the conservation area (Clark County 2010, p. 2). The conservation area will be protected from disturbance with construction of a permanent fence; whereas construction activities will simply be avoided in the management area (Clark County 2009c, p. 1). Educational and restrictive signage will be posted to help deter pedestrian traffic and use in the management area. A fence may be required to deter human use, but none is planned at this time (Clark County 2009c, p. 1).

Purchase of White Basin

In August 2007, BLM re-purchased approximately 30 acres of land owned by U.S. Borax (BLM 2008, p. 1), which supports the White Basin (1) site within the Muddy Mountains, White Basin

subpopulation. Approximately 19 percent of the remaining habitat (White Basin (2)) remains open to new mineral claims. A stipulation within the purchase agreement will prevent future mineral claims on these newly acquired lands; however, this purchase will not fully protect the plant because it is within a BLM special recreation management area that is open to OHV activity.

Withdrawal of Minerals Claims

Under a 2002 amendment to the SNPLMA, public minerals were withdrawn for a period of 5 years from all ACECs within the Southern Nevada District of the BLM. Two occurrences of *Eriogonum corymbosum* var. *nilesii*, Coyote Springs (1) and Gold Butte, are within ACECs established for the desert tortoise (*Gopherus agassizii*) (Mojave population). The mineral withdrawal would have expired in November 2007, but was extended for an additional 2-year period while a petition/application to withdrawal mineral entry for a 20-year period was being processed. In November 2009, the petition/application was granted and mineral entry has been withdrawn until 2029. This withdrawal protects less than 10 percent of the total remaining occupied acreage of the plant from locatable and solid leasable mining. This conservation effort is important; however, saleable and fluid leasable mineral development is allowed on ACECs with restrictions. Given the percentage of habitat currently open to new mineral claims, we do not believe this measure is sufficient to remove the threat posed by surface mining across the range of the variety.

Planning of CTA

In 2005, BLM initiated comprehensive planning for the CTA. A draft supplemental environmental impact statement to establish the boundary for the CTA to protect paleontological resources, archeological resources, mesquite-acacia woodland, *Arctomecon californica*, and *Eriogonum corymbosum* var. *nilesii* was released on January 22, 2010. The BLM is also analyzing various alternative boundaries for the CTA. The majority of alternatives being considered include provisions to permanently protect *E. corymbosum* var. *nilesii* habitat in the CTA; however, management of the area, the size of the buffer, and the area of protection from adjacent development and uses, is uncertain as is the configuration of roads, utility lines, and infrastructure in and adjacent to *E. corymbosum* var. *nilesii* habitat (BLM 2009, pp. 24-35). Because no formal agreement has been fully executed and there are currently no assurances that this effort will be implemented, we find that this measure does not reduce the magnitude or imminence of the threat posed by the development across the range of *E. corymbosum* var. *nilesii*.

Recreational use and illegal OHV activity will likely increase as development of the surrounding area continues. While some habitat was conserved by this effort, not enough is protected for us to consider the threat posed by urban development to be diminished or eliminated across the range of *Eriogonum corymbosum* var. *nilesii*.

SUMMARY OF THREATS

With regard to Factor A – The present or threatened destruction, modification, or curtailment of its habitat or range, the historic center of *Eriogonum corymbosum* var. *nilesii* distribution is the Las Vegas Valley. About 70 percent of the habitat within the historic distribution has been altered, primarily by various forms of urban development (NNHP 2007, p. 1) and is now considered unsuitable habitat for *E. corymbosum* var. *nilesii*. Most of the remaining acreage is at risk of development or surface mining. Habitat has been conserved in two site occurrences (Eglington Preserve and Muddy Mountains wilderness) and one subpopulation (Tropicana/Decatur). Conservation efforts are also underway to protect the CTA site from development; however, these efforts are not serving to reduce the magnitude or imminence of the threat posed by development across the range of *E. corymbosum* var. *nilesii*.

Regardless of habitat conservation status, approximately 95 percent of the remaining population (including the Eglington Preserve, CTA, Nellis AFB Area III (1), Tropicana/Decatur, Gold Butte, and White Basin (1 and 2) sites) is threatened by ongoing public recreation (Service 2007, pp. 1-21), especially OHV activity. The degree of impact is different for each site with four sites experiencing a high level of use (Nellis AFB Area III (1), Eglington Preserve, CTA, and Tropicana/Decatur). Fencing has been installed at two sites to limit dumping and illegal recreational use; however, these efforts are not sufficient to reduce the magnitude or imminence of the threat posed by recreation across the range.

Both the frequency and size of fires in the Mojave Desert have increased as a result of the introduction of non-native grasses and anthropogenic activities and have the potential to have devastating effects on *Eriogonum corymbosum* var. *nilesii*.

Regarding Factor D – The inadequacy of existing regulatory mechanisms, *Eriogonum corymbosum* var. *nilesii* is not protected by the State of Nevada, nor is it protected locally by municipalities or through the Clark County MSHCP. The variety is not fully protected on DOD lands at Nellis AFB. *E. corymbosum* var. *nilesii* has status as a BLM sensitive species; however, this status does not offer full protection. The occurrence of *E. corymbosum* var. *nilesii* was not considered in various congressional actions that transferred lands out of public ownership for development purposes. Its status as a candidate will ensure that *E. corymbosum* var. *nilesii* is included in NEPA planning for Federal projects; however, NEPA is a primarily a disclosure process and impacts to species may still occur.

Regarding Factor E – Other natural or manmade factors affecting its continued existence, the remaining subpopulations are all less than 370 acres in size, with sites typically ranging between 50 and 90 acres (Table 1) and therefore vulnerable to stochastic events, such as fire.

We have reviewed and evaluated the five listing factors with regard to the status of *Eriogonum corymbosum* var. *nilesii*. The Service considers a candidate species to be one for which we have on file sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened, but for which preparation and publication of a proposed rule is

precluded by higher priority listing actions. Based upon the information in our files, we find that there is sufficient information with regard to factors A, D, and E to conclude that *E. corymbosum* var. *nilesii* meets the definition of a candidate. We find that *E. corymbosum* var. *nilesii* is warranted for listing throughout all of its range, and, therefore, it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

RECOMMENDED CONSERVATION MEASURES

These conservation measures have not yet been implemented, but have been developed and reviewed in cooperation with other State and Federal agencies:

- Complete pending conservation actions including formal establishment of the CTA in the Upper Las Vegas Wash subpopulation and a conservation agreement with DOD to preserve a 233-acre portion of Nellis AFB Area III.
- Extend regulatory protection to *Eriogonum corymbosum* var. *nilesii* under State law and the Clark County MSHCP.
- Work to better understand and remove recreation impacts (e.g., OHV impacts) through increased law enforcement, trail closures, and fencing, to completely eliminate OHV use of occupied habitat.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6*
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:

The magnitude of threats to *Eriogonum corymbosum* var. *nilesii* is considered high based on its limited distribution, small subpopulations, and a lack of comprehensive conservation measures. The primary threats include habitat destruction or modification from development, mining, and recreation (Factor A), and inadequate regulatory mechanisms (Factor D).

Potential urban development and surface mining of the remaining Las Vegas Valley subpopulations together threaten roughly 30 percent of the remaining undeveloped habitat. We consider the threats posed by development and mining to be of highest magnitude because these result in a permanent loss of habitat.

Recreation, particularly OHV activity, threatens roughly 95 percent of the remaining habitat. The BLM's ability to enforce existing OHV restrictions within occupied habitat is presently hampered by limited budgets and staff. Without a coordinated conservation approach, this threat will continue to play a role in the tenuous status of this plant. Because the effects of recreation (1) may not be permanent; (2) generally result in a gradual versus immediate decline in habitat quality; and (3) are not uniform across sites, we consider the threat posed by recreation of less magnitude than development.

Imminence:

Eriogonum corymbosum var. *nilesii* is facing a combination of imminent and non-imminent threats. We considered the contribution and potential effects of each threat to the overall status of *E. corymbosum* var. *nilesii* as well as the number of present, proposed, and future projects within occupied habitat. We determine that non-imminent best describes the overall combined threats facing *E. corymbosum* var. *nilesii*. Even with three approved development project, we consider the threat posed by development non-imminent because an economic decline and lack of funding for these projects. We have specific information in our files (Service 2007, pp. 1-21) that leads us to believe ongoing and increased OHV recreation poses an imminent threat on 95 percent of the remaining population. We determined inadequacy of regulatory mechanisms to be a non-imminent threat to *E. corymbosum* var. *nilesii*.

Both BLM and DOD have regulatory mechanisms that offer some protection to *Eriogonum corymbosum* var. *nilesii* from destruction from OHV, other recreation, and development activity; however, enforcement is limited by staffing and budget constraints. Given these limitations, some impacts to *E. corymbosum* var. *nilesii* have occurred, but in most cases, projects have been implemented with conservation and impact minimization measures (such as establishing the Eglington Preserve, and the salvage and translocation of individual plants). In addition, BLM and DOD have both attempted to limit recreation by fencing occupied habitat (while these efforts have not been entirely successful, they demonstrate each agency's commitment to conserve the plant).

The net effect is that the existing regulatory mechanisms and conservation efforts, such as NEPA and the BLM's designation of sensitive species status, have slowed, rather than stopped the destruction of *Eriogonum corymbosum* var. *nilesii* habitat.

Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? Yes.

Is Emergency Listing Warranted? No. The immediate loss of a significant portion of *Eriogonum corymbosum* var. *nilesii* population is unlikely.

DESCRIPTION OF MONITORING

Currently, there is no formal monitoring program for *Eriogonum corymbosum* var. *nilesii* throughout its range. Monitoring the threats and status of populations will continue by both the Service and the BLM as funds, workloads, and staff time allow. Clark County (Clark County 2009b, pp. 8-9, 31-32) is conducting field evaluations and developing a predictive model to identify potentially suitable habitats for *E. corymbosum* var. *nilesii*.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: At present, the entire range of *Eriogonum corymbosum* var. *nilesii* is presumed to be in Clark County, Nevada. Nevada currently does not extend regulatory protection to *E. corymbosum* var. *nilesii*. A copy of this assessment has been provided to NDF, Clark County, and the NNHP. In 2010, BLM, NDF, Clark County, and NNHP all provided input that was used in this species assessment.

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____
Regional Director, Fish and Wildlife Service Date 6-7-2010

Concur: _____
ACTING
Director, Fish and Wildlife Service Date: October 22, 2010

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April 2010
Conducted by: Brian A. Novosak

FY 2010, R8 CNOR: Las Vegas buckwheat