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

SCIENTIFIC NAME: *Sceloporus arenicolus*

COMMON NAME: Sand dune lizard

LEAD REGION: Region 2

INFORMATION CURRENT AS OF: March 2007

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: June 6, 2002
_ 90-day positive - FR date:
_X_ 12-month warranted but precluded - FR date: December 27, 2004
_ 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.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, since publication of the last CNOR, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs) because most of our national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken, see the discussion of "Progress on Revising the Lists" in the current CNOR, which can be viewed on our Internet website (http://endangered.fws.gov/).

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

Date when the species first became a Candidate (as currently defined): October 17, 2001

___ 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: Reptiles, Iguanidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: New Mexico and Texas

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Southeastern New Mexico (Chaves, Eddy, Lea, and Roosevelt counties) and adjacent west Texas (Andrews, Crane, Gaines, Ward, and Winkler counties)

LAND OWNERSHIP: The sand dune lizard occurs on Bureau of Land Management (BLM), State of New Mexico, State of Texas, and private lands. In New Mexico, lands under State or Federal jurisdiction account for more than 70 percent of the sand dune lizard's range, and private lands represent less than 30 percent. Approximately one-half of sand dune lizard habitat in New Mexico occurs on lands administered by the BLM (BLM 2006). Extrapolating from these estimates and other information available to the New Mexico Ecological Services Field Office (NMESFO), approximately 208,000 acres of sand dune lizard suitable habitat occurs on BLM-managed lands, 135,142 acres occurs on State Land Office (SLO) land (S. Knox, State Land Office, pers. comm., 2007), and 72,855 acres occurs on privately-owned lands in New Mexico. Land ownership within the sand dune lizard's range in Texas is currently unquantified, but initial research has indicated that both private and State-owned lands contain suitable habitat for sand dune lizards in west Texas (Laurencio et al. 2006). At this time, a range-wide population estimate for the sand dune lizard has not been calculated (C. Painter, New Mexico Department of Game and Fish, pers. comm. 2007).

LEAD REGION CONTACT: Susan Jacobsen, 505-248-6641

LEAD FIELD OFFICE CONTACT: Patricia Zenone, Ph.D., 505-761-4718, New Mexico Ecological Services Field Office

BIOLOGICAL INFORMATION: The information in this candidate form is based on the Management Plan for the Sand Dune Lizard, *Sceloporus arenicolus*, in New Mexico (Painter et al. 1999) and communications with the principal investigator, Charlie Painter, of the New Mexico Department of Game and Fish (NMDGF). An addendum to this management plan was submitted to the NMESFO in 2002. This information is primarily the result of studies of the sand dune lizard funded under section 6 of the Endangered Species Act. Additional information contained in our files, including recent reports from BLM and the petition to list the species, received on June 6, 2002, were also reviewed and considered.

The taxonomy of the sand dune lizard has been reviewed, and it is recognized as a distinct species (Smith et al. 1992, cited in Snell et al. 1997; Degenhardt et al. 1996). The sand dune lizard is endemic to a small area in southeastern New Mexico (Chaves, Eddy, Lea, and Roosevelt counties) and adjacent west Texas (Andrews, Crane, Gaines, Ward, and Winkler counties). It has the second-most restricted range of any native lizard in the United States (Degenhardt et al. 1996). Within this area, the suitable habitat, defined as known and potentially occupied habitat, is only 1,697 square kilometers (655 square miles) in New Mexico, and a currently unquantified, but likely smaller, area in west Texas. Information about the historic distribution of the sand dune lizard is limited. The historic range is thought to have been larger than the area occupied today (BLM 2006).

The sand dune lizard is active between April and September. Females can reach sexual maturity during their first spring following hatching. Females produce one to two clutches per year, averaging about five eggs each. Hatchlings emerge between July and September. Sand dune lizards feed on ants, small beetles, crickets, grasshoppers, and spiders. Most feeding takes place within or adjacent to patches of vegetation, usually shinnery oak habitat. Individuals are diurnal and wary, and will seek protection and shelter in burrows, under the sand, or beneath leaf litter (BLM 2006).

The sand dune lizard's distribution is localized and fragmented, where known populations are separated by vast areas of unoccupied habitat. The species is restricted to active and semi-stabilized sand dunes associated with shinnery oak (*Quercus harvardii*) and scattered sandsage (*Artemisia filifolia*). This species occurs only in large and deep sand dune "blowouts" (i.e., open, low-lying areas between active dunes) in areas dominated by shinnery oak, and is not found at sites lacking shinnery oak habitat. Fitzgerald et al. (1997) observed isolated areas of apparently suitable habitat that did not contain sand dune lizards. It is possible that these observations are the result of local extinction events in isolated areas where recolonization is either impossible or has not yet occurred (Snell et al. 1997).

Recent surveys by BLM have reconfirmed the presence of sand dune lizards within known occupied habitat in New Mexico, and have also recorded five observations of sand dune lizards outside of the range polygon that was developed by the NMDGF. Of these five points, at least three represented different individuals. These surveys also detected a hatchling in the area outside the polygon, indicating that more individuals were likely present (Bird 2007).

Sand dune lizard population and distribution surveys have begun for the Texas portion of the species' range. A grant through the Texas Parks and Wildlife Department is funding these surveys (Laurencio et al. 2006). Initial surveys have detected very few sand dune lizards where surveys have been conducted in west Texas (Laurencio et al. 2006).

THREATS

A. <u>The present or threatened destruction, modification, or curtailment of its habitat or range</u>. Extensive surveys, conducted in conjunction with a 5-year study, documented sand dune lizards at half of the sites surveyed (Painter et al. 1999). The population of sand dune lizards has been impacted by spraying the herbicide Tebuthiuron to control shinnery oak (Snell et al. 1997). For example, it is estimated that about 25 percent of the total sand dune lizard habitat in New Mexico was eliminated from 1989 through 1999 due to shinnery oak removal from the application of Tebuthiuron (Painter et al. 1999).

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Similarly, oil and gas extraction activities have disturbed and fragmented shinnery oak/sand dune habitat and resulted in reductions in sand dune lizard numbers. Sias and Snell (1998) reported a negative relationship between oil well density and sand dune lizard abundance, and they detected an environmental sensitivity not found in sympatric reptile species. Oil and gas development in southeastern New Mexico has accelerated in recent years. Currently, more than 60 percent of land within the New Mexico range of the sand dune lizard has been leased by the BLM or the State Land Office for oil and gas exploration (Gregory Homan, BLM, pers. comm. 2004). Research has demonstrated that, at 13 wells per section, sand dune lizard populations decline by a minimum of 25 percent. An estimated 50 percent decline in sand dune lizard populations can be expected in areas with 30 oil and/or gas wells per section (Sias and Snell 1998). In two sections of occupied sand dune lizard habitat in New Mexico, approximately forty wells have been built, and this density has very likely impacted this population (C. Painter, NMDGF, pers. comm. 2005). Extensive oil field development, residual toxic contamination, and reduced and fragmented habitat increase the risk of extinction for the sand dune lizard (Painter et al. 1999). Similar observations of fragmented and reduced habitat availability and low numbers of sand dune lizard detections have come from a preliminary study of the Texas population (L. A. Fitzgerald, Texas A & M University, pers. comm. 2007)

Therefore, sand dune lizard populations may be threatened by activities that remove shinnery oak, or otherwise alter the configuration of shrub and grass cover and blowout patches in dune areas. The two main threats faced by the sand dune lizard are the removal of shinnery oak by

herbicide application, and disturbance of dune areas by roads and infrastructure from activities such as oil and gas development. Therefore, increased fragmentation of dune habitat from removal of shinnery oak and oil and gas development may isolate sand dune lizard populations, making extinction of the species likely (Snell et al. 1997). In fact, significant amounts of habitat disturbance have already occurred within the range of the sand dune lizard, and researchers believe that the current distribution and range is a small, but important part of its historical range (Snell et al. 1997). The potential to restart a shinnery oak removal program and the continued oil and gas development on public and private lands makes the current status of the sand dune lizard precarious. In fact, Snell et al. (1997) concluded that management or conservation activity may not prevent the extinction of the sand dune lizard.

The New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working/Implementation Group, a Southeast Stakeholder Group (see CONSERVATION MEASURES PLANNED OR IMPLEMENTED section below for more information on this group), studied the inter-dune areas of shinnery oak flats to determine if hatchling sand dune lizards use these areas for dispersal. In 2002, a series of pitfall trap transects were set. A few juvenile sand dune lizards were trapped in these areas, indicating that these shinnery oak flats between the sand dunes habitat may be important for dispersal. In the past, oil and gas development has been directed into the shinnery oak flats and out of the dune complexes to lessen the impact to the sand dune lizard. However, development in the shinnery oak flats may be affecting dispersal of the sand dune lizards from one dune complex to another (C. Painter, New Mexico Department of Game and Fish, pers. comm. 2003).

Concentrated off-road vehicle (ORV) use may be injurious to sand dune lizards and may alter sand dune structure. Apart from one designated ORV-use area at Mescalero Dunes, ORV use is thought to be relatively limited within the range of the sand dune lizard in New Mexico, and significant impacts have not been demonstrated. Use of "thumper trucks" for seismic oil and gas exploration has the potential to crush hibernating lizards and underground nests. No data are available on the extent to which this impact may be occurring (BLM 2006).

It is not known whether livestock grazing directly threatens the sand dune lizard. However, range improvement projects for livestock grazing are the main impetus for shinnery oak removal; therefore, habitat manipulations associated with livestock grazing can result in a significant indirect effect to the species.

The NMESFO recently conducted a study to examine the potential effects of hydrogen sulfide emitted by oil and gas activities on wildlife near the cities of Roswell, Artesia, Hobbs, and Carlsbad in southeastern New Mexico. Hydrogen sulfide is a colorless, flammable, and highly toxic gas that is often a byproduct of petroleum production. Modeling studies suggest that actively ventilating sand dune lizards should begin to show adverse effects at concentrations of hydrogen sulfide greater than 14 parts per million (J. Lusk, NMESFO, electronic mail message 2007). Hydrogen sulfide concentrations up to 26 parts per million for 1 hour under calm wind conditions, and up to 33 parts per million for 32 minutes with winds approaching 17 miles per

hour were measured. Therefore, ambient concentrations were detected at levels that could have adverse effects on active sand dune lizards (J. Lusk, NMESFO, electronic mail message 2007). The extent of these potential adverse effects on the population status of the sand dune lizard was not evaluated in this study

B. Overutilization for commercial, recreational, scientific, or educational purposes. The sand dune lizard is not a commercially valuable species, but may be increasingly sought by collectors due to its increasing rarity. Areas inhabited by this species are open to public access and its populations are thought to be small and localized. Although scientific collecting is not thought to represent a significant threat, localized populations could become impacted and possibly extirpated by improper collecting.

C. Disease or predation. Not known to be a factor threatening the sand dune lizard.

D. The inadequacy of existing regulatory mechanisms. The sand dune lizard occurs on lands managed by the BLM, the States of New Mexico and Texas, and private entities. The BLM has the authority to manage the land and activities under their administration to conserve the sand dune lizard. For example, the sand dune lizard is listed as a species of concern by the Roswell and Carlsbad BLM Field Offices, and they have reduced potentially adverse impacts to the sand dune lizard by limiting their removal of shinnery oak. In 2006, these offices drafted a Resource Management Plan Amendment and Environmental Impact Statement to address threats to this species, primarily shinnery oak removal and oil and gas development, and implement specific conservation and recovery needs for the sand dune lizard (BLM 2006). This amendment is projected to be finalized late in 2007. In New Mexico, private and State lands where this species occurs constitute an estimated 50 percent of the range of the sand dune lizard (Painter et al. 1999). These lands have a substantial role in the conservation of the sand dune lizard. Moreover, while oil, gas, and minerals under Federal jurisdiction constitute 55 percent of sand dune lizard range in New Mexico, non-Federal jurisdiction over oil, gas, and minerals is maintained in up to 45 percent of the species' range (Steve Bird, BLM, electronic mail message 2007). There are no local or State regulatory mechanisms pertaining to the sand dune lizard on State or non-Federal lands, and there is not a State Land Office policy in place to protect sensitive species in Eddy or Lea counties. Much of the range of the sand dune lizard falls within proven oil and gas areas that are under intense pressure for development (David Coss, SLO, pers. comm. 2004). In 2005, the status of the sand dune lizard was changed from threatened to endangered under the New Mexico Wildlife Conservation Act (New Mexico's endangered species act), which affords this species protection from been killed. However, uplisting from threatened to endangered confers no regulatory authority to the NMDGF over the habitat of this species. The sand dune lizard is not State-listed as threatened or endangered in Texas. Finally, there are no other federally listed species within the range of the sand dune lizard that might provide umbrella protection for the species.

E. Other natural or manmade factors affecting its continued existence. The geographically restricted range of the sand dune lizard increases the possibility that a human-caused or natural event could eliminate the species.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED: Sand dune lizard population and distribution surveys will continue in the Texas portion of the species' range in 2007. In New Mexico, status assessment of the sand dune lizard throughout its range is ongoing, with inventory efforts being coordinated between the NMDGF, BLM, and the Service. Field research efforts have been completed, following a 5-year study funded with section 6 financial support. As part of these studies, in 1999, we received and reviewed a Management Plan for the Sand Dune Lizard, *Sceloporus arenicolus*, in New Mexico (Painter et al. 1999), which was revised in June 2002. The sand dune lizard is listed as a "Species of Greatest Conservation Need in the Southern Shortgrass Prairie Ecoregion in New Mexico" in the Comprehensive Wildlife Conservation Strategy for New Mexico (NMDGF 2006, p. 201). It has also been prioritized for recovery plan development by the State of New Mexico (NMDGF 2006, p. 423).

Recent surveys by BLM are being used to make recommendations to manage for oil and gas development in occupied and suitable dune complexes for the sand dune lizard (Bird 2007). The sand dune lizard is listed as a Special Status Species by the Roswell and Carlsbad BLM Field Offices, and they have reduced potentially adverse impacts to the sand dune lizard by limiting their removal of shinnery oak.

Since February 2003, the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working/Implementation Group has met "*to create a conservation strategy for the conservation of shinnery oak habitat that offers a range of specific actions for the recovery of the Lesser Prairie-chicken and sand dune lizard and takes into account other uses of the land*." This group has broad representation from the oil and gas and livestock industries, local governments, conservation/environmental interests, sportsmen/recreation, State and Federal agencies (State of New Mexico, Natural Resources Conservation Service, Service, and BLM), and independent technical advisors. The group completed a Conservation Strategy that outlines broad policies and plans for land management and a set of voluntary conservation efforts by stakeholders, and they submitted their draft Conservation Strategy for approval to the BLM on February 26, 2005. Their document, Collaborative Conservation Strategies for the Lesser Prairie-Chicken and Sand Dune Lizard in New Mexico**:** Findings and Recommendations of the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working Group, dated August 2005, was included in the draft Resource Management Plan Amendment by the Pecos District Office of BLM (BLM 2006). This group recommends 500-meter buffer areas prohibiting herbicide spraying in occupied and suitable habitat and dispersal corridors. Their oil and gas development recommendations include: 1) restricting well-pad placement on or within 100 meters of sand dunes, 2) restricting construction of more than 13 well pads per square mile, and 3) minimizing new well pad development in occupied and suitable habitat. The group also recommends restricting off-road vehicle use to existing recreational areas and developing a public outreach awareness program.

Although these plans and strategies are designed to address the greatest threats to the conservation of the sand dune lizard, the recommendations have not yet been implemented or for long enough that actions can demonstrate positive results. Once implementations has occurred to a greater extent, the current level of habitat destruction and fragmentation may be reduced or level off in New Mexico. In west Texas, studies have not yet been conducted to analyze threats and how to address them.

SUMMARY OF THREATS: The distribution of sand dune lizards is localized and fragmented, and this species is a habitat specialist. Therefore, impacts to its habitat will most likely greatly decrease populations. If herbicide application continues, and oil and gas development progresses as expected, the magnitude of threat to sand dune lizards will increase. Continued pressure to develop oil and gas resources in areas with sand dune lizards poses an imminent threat to the species. The limited geographic range of the sand dune lizard poses a significant risk of extinction for this species given the loss and degradation of suitable habitat and increased risk of extinction from the present or threatened destruction of its habitat. Considering the magnitude and imminence of threats and the vulnerability of extant localities, the sand dune lizard is likely to be in danger of extinction throughout all of its range.

LISTING PRIORITY

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

RATIONALE FOR LISTING PRIORITY NUMBER:

Magnitude: The population of sand dune lizards has been impacted by spraying the herbicide, Tebuthiuron, to control shinnery oak and by oil and gas field development. About 25 percent of the total sand dune lizard habitat in New Mexico was eliminated between 1989 and 1999 from the application of Tebuthiuron (Painter et al. 1999). Moreover, oil and gas development in southeastern New Mexico has accelerated in recent years. Currently, more than 60 percent of

land within the New Mexico range of the sand dune lizard has been leased by the BLM or the State Land Office for oil and gas exploration (Gregory Homan, BLM, pers. comm., 2004). Research has demonstrated that, at 13 wells per section, sand dune lizard populations decline by a minimum of 25 percent. An estimated 50 percent decline in sand dune lizard populations can be expected in areas with 30 oil and/or gas wells per section (Sias and Snell 1998). The distribution of sand dune lizards is localized and fragmented, and this species is a habitat specialist. Therefore, impacts to its habitat will likely greatly decrease the numbers of individuals within the population. If herbicide application continues and oil and gas development progresses as expected, the magnitude of threat to sand dune lizards remains high.

Imminence: The two main threats to sand dune lizards include the application of herbicides to control shinnery oak and oil and gas development. We are unable to predict when or where future herbicide application will occur. Therefore, we can not say at this time whether herbicide treatment threats are imminent. However, continued pressure to develop oil and gas resources in areas with sand dune lizards poses an imminent threat to the species.

For the reasons described above, we continue to assign this species a listing priority number of 2. We find that this species is warranted for listing throughout all of its range; and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

_X_ 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.

Given the information we currently have on the status of the populations, threats, and conservation actions in New Mexico and Texas, we do not believe this species warrants emergency listing. The New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working/Implementation Group has developed a Conservation Strategy for the conservation of shinnery oak habitat and the sand dune lizard. It outlines broad policies and plans for land management and a set of voluntary efforts by stakeholders. Once this plan is in place and being implemented, the current level of habitat destruction and fragmentation may be reduced or become stabilized in New Mexico.

DESCRIPTION OF MONITORING: Staff members from the New Mexico Ecological Services Field Office attend meetings of the New Mexico Lesser Prairie-Chicken/Sand Dune Lizard Working/Implementation Group,,and we receive annual monitoring and species status reports from the State of New Mexico. The Service will continue to monitor the recommendations and progress of the group. We also meet with the NMDGF sand dune lizard lead biologist for section 6-funded research projects and/or his supervisor regularly and have participated in site visits to suitable and occupied sand dune lizard habitats in New Mexico. Texas Parks and Wildlife Department has awarded a grant to herpetologists at Texas A&M University to conduct sand

dune lizard surveys in the Texas portion of the species' range. We will receive annual reports on these sand dune lizard survey results in Texas.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: New Mexico and Texas.

Indicate which State(s) did not provide any information or comments: None.

LITERATURE CITED

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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: _____ _4/27/2007
Regional Director, Fish and Wildlife Service Date

Concur: Kenneth Stansell November 27, 2007
Acting Director, U.S. Fish and Wildlife Service Date

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

Director's Remarks:

Date of annual review: March 22, 2007
Conducted by: Dr. Patricia Zenone, New Mexico Ecological Services Field Office, Albuquerque, New Mexico.