RECOVERY OUTLINE
for the

Sclerocactus brevispinus
(Pariette Cactus)

Utah Ecological Services Field Office
April 2010

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I. INTRODUCTION

This document provides an overview of the known information for *Sclerocactus brevispinus* (Pariette cactus) and serves to guide recovery efforts and inform consultation and permitting activities until a comprehensive recovery plan for the species is approved. While this species has been protected under the Endangered Species Act (Act) since 1979 (44 FR 58868, October 11, 1979), until recently it was considered a part of *S. glaucus* (Uinta Basin hookless cactus). On September 15, 2009 (74 FR 47112), we officially recognized the taxonomic split of this species into three distinct species: *S. brevispinus*, *S. glaucus* (Colorado hookless cactus), and *S. wetlandicus* (Uinta Basin hookless cactus). As a newly listed species under the Act, the recovery needs of each species are being considered separately. This document supersedes all prior recovery planning documents.[1]

- Listing and Contact Information:

Scientific Name:	*Sclerocactus brevispinus*
Common Name:	Pariette cactus
Listing Classification:	Threatened[2]
Original Listing:	44 FR 58868, October 11, 1979
Revised Listing:	74 FR 47112, September 15, 2009
Lead Agency, Region:	U.S. Fish and Wildlife Service, Region 6
Lead Field Office:	Utah Ecological Services Field Office
Contact Biologists:	Larry England, (801) 975-3330, Larry_England@fws.gov Jessi Brunson, (435) 781-4448, Jessi_Brunson@fws.gov

[1] A recovery plan for Uinta Basin Hookless Cactus (*Sclerocactus glaucus*) was completed in 1990, prior to taxonomic revision of this species complex into three distinct species: *Sclerocactus glaucus, Sclerocactus brevispinus*, and *Sclerocactus wetlandicus* (74 FR 47112, September 15, 2009). This recovery plan is neither sufficient nor up-to-date enough to direct the current and future recovery of *Sclerocactus brevispinus*.

[2] While this species warrants endangered status, uplisting to endangered is precluded by higher priority listing actions (72 FR 53211, September 18, 2007).

II. RECOVERY STATUS ASSESSMENT

A. BIOLOGICAL ASSESSMENT

Taxonomy: The original listing rule for *S. glaucus* (44 FR 58868, October 11, 1979) included all hookless (straight central spines) *Sclerocactus* populations in western Colorado and northeastern Utah, and referred to them as *S. glaucus* per Benson (1966, pp. 50-57; 1982, pp. 728-729). This taxonomic classification is not supported by the results of more recent research.

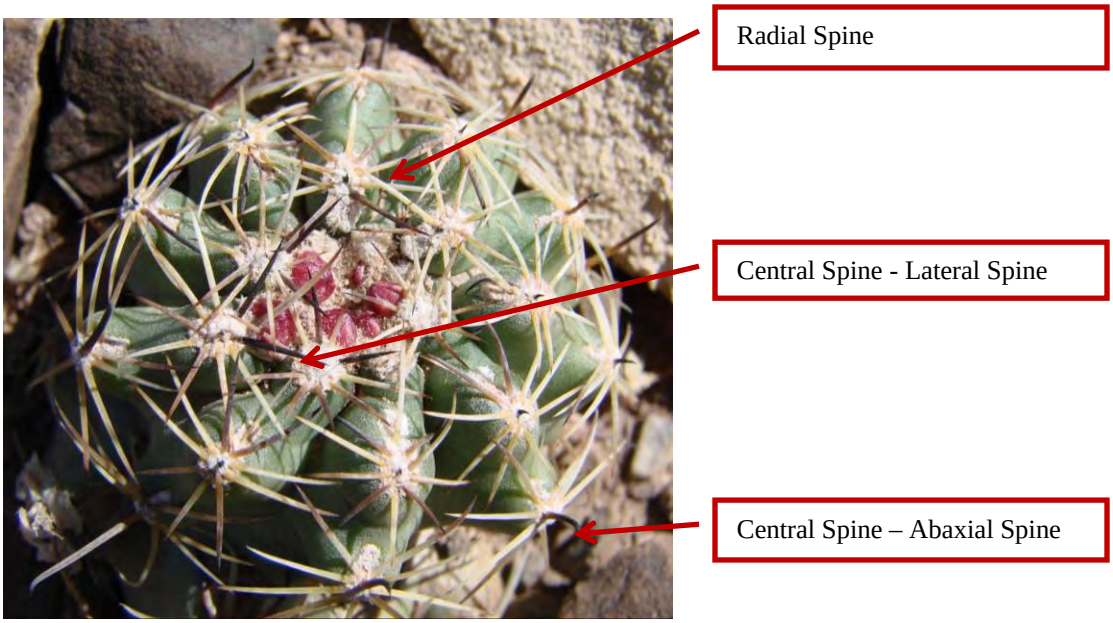
Genetic studies (Porter et al. 2000), common garden experiments (Hochstätter 1993; Welsh et al. 2003), and a reevaluation of the morphological characteristics of *S. glaucus*, led to separating this species into three distinct species: *S. brevispinus, S. glaucus,* and *S. wetlandicus* (Hochstätter 1993; Heil and Porter 2004). We recognized these three distinct species as threatened on September 15, 2009 (74 FR 47112). The *Flora of North America* recognizes 15 species in the genus *Sclerocactus,* including these 3 species (Heil and Porter 2004). Comparative DNA sequences (Porter et al. 2000) infer common ancestry between *S. brevispinus* and *S. wetlandicus,* but infer *S. glaucus* is more closely related to *S. parviflorus* (Devil's claw cactus) and *S. whipplei* (Whipple's fishhook cactus).

The common name for *S. glaucus* was changed to Colorado hookless cactus as the species is endemic to western Colorado. *S. wetlandicus* is now known as the Uinta Basin hookless cactus as this species occurs across Utah's Uinta Basin. *S. brevispinus* is now known as the Pariette cactus as it is limited to the Pariette Draw of the central Uinta Basin.

The Uinta Basin hookless cactus complex will be used to refer to the combination of all three species previously listed as a single entity.

Description, Habitat, and Life History: *S. brevispinus* is a barrel-shaped cactus that ranges from 2.5 to 8 centimeters (cm) (1.0 to 3.1 inches (in.)) tall. *S. brevispinus* is a morphologically unique *Sclerocactus*, with flowering adults that are much smaller than either *S. glaucus* or *S. wetlandicus*. *S. brevispinus* has stems with typically 13 ribs that extend from the ground to the tip of the plant. Along the ribs are areoles (small, cushion-like areas) with hooked spines (Heil and Porter 2004). There are three types of spines, radial and central, defined by the size and position on the plant (see Figure 1) (74 FR 47112, September 15, 2009). The 5 to 13 radial spines are located around the margin of the areole, extending in a plane parallel to the body of the plant. The radial spines are white or gray to light brown, and are 5 to 15 millimeters (mm) (0.2 to 0.6 in.) long. The 0 to 3 central spines are 2 to 5 mm (0.08 to 0.2 in.) long and extend from the center of the areole. The central spines include abaxial and lateral forms. Abaxial spines are typically single and are strongly hooked with the tip almost touching the surface of the areole. Lateral spines are usually absent, but when present are on either side of the abaxial spine, are more or less straight without the obvious bend or hook, and form an acute angle with the abaxial spine (usually 20 to 50 degrees).

Figure 1. Spine types of a *S. brevispinus*.



The bell-shaped flowers usually have pink tepals (petal-like flower parts not differentiated into petals and sepals) and yellow stamens (the male reproductive organ of the flower), and are 1 to 1.5 cm (0.4 to 0.6 in.) long and 1.2 to 3 cm (0.4 to 1.2 in.) wide (74 FR 47112, September 15, 2009). The fruit is short, barrel-shaped, reddish or reddish grey when ripe, 7 to 12 mm (0.3 to 0.5 in.) wide, and 9 to 25 mm (0.35 to 1.0 in.) long.

S. brevispinus grows on fine soils in clay badlands derived from the Uinta formation (U.S. Fish and Wildlife Service (Service) 1990). Its habitat is sparsely vegetated desert shrubland dominated by *Atriplex*, *Chrysothamnus*, and *Tetradymia* species (Service 1990, 2007).

The life history of *S. brevispinus* is poorly known, but it is thought to be a long-lived perennial usually flowering after 3 or 4 years. A broad assemblage of native bees and possibly other insects, including ants and beetles, pollinate *S. brevispinus* (Service 1990, 2007).

Distribution, Abundance, and Trends: *S. brevispinus* is restricted to one population in a 29,000-hectare (ha) (72,000-acre (ac)) area located in the Pariette Draw along the Duchesne-Uintah County boundary (RANA 2009). Land ownership within the range of the species includes Bureau of Land Management (BLM), Ute Tribe, State of Utah, and private land, with the majority of the species' known population occurring on BLM and Ute Tribal lands (Table 1) (Service 2009). Some individuals have been found in marginal habitats outside of the main population areas. More information is needed to better map the species' range in these areas.

We estimate the species' total population at approximately 12,000 known cactus locations, with most known cacti located on Ute Tribal lands (Table 1) (72 FR 53211, September 18, 2007). Each cactus location represents at least one cactus, but could represent multiple cacti.

Table 1. *S. brevispinus* potential habitat and known cactus locations by landowner.

Landowner	Potential Habitat hectares (acres)	Known Cactus Locations
Federal	12,614 ha (31,170 ac)	2,445
Private	8,383 ha (20,715 ac)	387
State	2,002 ha (4,947 ac)	1
Tribal	6,097 ha (15, 066 ac)	9,034
Total	**29,096 ha (71,898 ac)**	**11,867**

We do not have long-term status or trend population data for *S. brevispinus*. A 1985 species inventory documented a population of 3,795 individuals on approximately 6,000 ha (15,000 ac) of BLM land, and minor amounts of State and private lands (BLM 1985; Heil and Porter 1994). The BLM estimated that this population represented 75 percent of the species population on BLM-managed lands (72 FR 53213, September 18, 2007). More recent data indicate at least 2,200 cactus locations, each of which may represent multiple individuals, on BLM lands (BLM 2009). The total population of *S. brevispinus* on the Uintah and Ouray Reservation of the Ute Tribe, directly north and adjacent to BLM lands, is unknown. The Ute Tribe conducted project-specific inventories in 2007, 2008, and 2009, covering a large portion of cactus habitat on tribal land. Preliminary results indicate an estimate of over 9,000 individuals (SWCA 2008; RANA 2009).

B. VULNERABILITY AND THREATS ASSESSMENT

At the time of original listing of the Uinta Basin hookless cactus complex, ongoing and foreseeable threats included mineral and energy development, illegal collection, recreational off-road vehicle (ORV) use, and grazing. Energy development remains one of the largest threats to this species through direct loss of habitat, and it is occurring in *S. brevispinus* habitat at a rate much greater than existed at the time of the 1979 listing.

We recently determined that reclassifying *S. brevispinus* as endangered was warranted but precluded due to the extent of current and pending energy development across the cactus' entire range (72 FR 53211, September 18, 2007).

Oil and Gas Development and Associated Impacts: Of the potential *S. brevispinus* habitat on BLM lands, 100 percent has been leased for oil and gas development by Newfield Exploration Company and Gasco Energy. On Ute Tribal lands, the Green River Development Area (an energy development project) overlaps 100 percent of potential *S. brevispinus* habitat.

Currently, 1,290 wells exist or are planned in *S. brevispinus* potential habitat across all landowners. In *S. brevispinus* potential habitat on BLM lands, there are 846 wells; on tribal lands there are 103 (Utah Division of Oil, Gas, and Mining 2009). Some of these wells are plugged and abandoned, shut-in, or in an abandoned location, but they may be reopened for future development. Increased surface disturbance from wells, roads and pipelines for oil and gas projects can result in the following impacts to *S. brevispinus* and its habitat:

- Oil and gas development fragments and destroys *S. brevispinus* suitable habitat (BLM 2005; 2008). Each well disturbs approximately 0.6 ha (1.5 ac) of surface area (Hereford 2009). Roads, pipelines, and related infrastructure are constructed in association with each well pad, substantially increasing the amount of habitat loss and fragmentation. Habitat loss and fragmentation modify the plant's interactions with other individuals of the same species, exacerbating edge effects and potentially affecting the genetic composition of local populations (Debinski and Holt 2000).
- Increased erosion, soil compaction, and sedimentation can kill cacti (BLM 2005). Cactus seeds can be buried and lost due to erosion runoff from well-field facilities (BLM 2005).
- Increased surface disturbance increases airborne dust. Dust accumulation on cacti increases leaf temperature and reduces photosynthesis, thus decreasing plant growth, vigor, and water use efficiency (Farmer 1993; Sharifi et al. 1997). Dust effects can extend up to 300 m from roads (Everett 1980). This estimate indicates the 1,290 drilled wells have impacted approximately 12,500 ha (31,000 ac), approximately 61 percent of potential *S. brevispinus* habitat.
- Energy development requires the addition of access roads in previously undeveloped areas. In most cases, these access roads can be used by the public. The ORV users can crush cacti, and the ORV trail use increases erosion, soil compaction, and sedimentation (Service 1990; BLM 2008).
- Human access can result in illegal collection and the direct loss of individual plants (Service 1990; BLM 2005). Collection is an ongoing threat to *S. brevispinus* (further discussion below).
- Oil and gas development increases noxious weed invasions because of the associated surface disturbance. For example, Ute Tribal lands, where less energy development has occurred, have fewer noxious weeds than adjacent, highly developed, BLM lands (72 FR 53214, September 18, 2007). Increased noxious weeds alter the ecological characteristics of cactus habitat, making it less suitable for the species (Service 1990; BLM 2008).

The BLM is monitoring *S. brevispinus* populations and neighboring *Sclerocactus* species, including impacts associated with oil and gas development. Initial results show potential effects of oil and gas development (i.e., roads and well pads) on the survival and reproductive success of *S. brevispinus* (72 FR 53215, September 18, 2007).

Collection: Illegal collection is a significant threat to *S. brevispinus*. The original listing of *S. glaucus* concluded that the cactus is prized among collectors and threatened by unregulated commercial trade (44 FR 58869, October 11, 1979). Collectors prefer larger, reproductive age individuals, leaving behind a younger, less reproductive population. As of 2006, approximately 96 percent of the known range of *S. brevispinus* (at the time, 5,733 ha or 14,166 ac) was within 400 m (1,312 ft) of a well (Service 2006). Such development facilitates human access and discovery by illegal collectors (72 FR 53216, September 18, 2007).

Livestock Grazing and Trampling: Nearly all *S. brevispinus* potential habitat on BLM land is leased for grazing. The species range overlaps four BLM grazing allotments. Most of the area is grazed by sheep, either continuously or on a deferred rotation, with some cattle grazing on the western and eastern edges of *S. brevispinus* potential habitat. Livestock grazing results in *S. brevispinus* mortality when livestock trample individual cacti (Service 1990; Utah Natural Heritage Program 2006; BLM 2008; 72 FR 53215, September 18, 2007). Overgrazing—the continued heavy grazing beyond the recovery capacity of forage plants (Vallentine 1990)—by domestic livestock degrades western ecosystem functions and structures (Fleischner 1994). Overgrazing can facilitate the establishment of invasive species like cheatgrass (Masters and Sheley 2001), which are difficult to eradicate and tend to outcompete native vegetation, including cacti. Invasive weeds (including *Bromus tectorum* and *Halogeton glomeratus*) are prevalent on BLM lands in the range of *S. brevispinus* cactus and less so on tribal lands where grazing has been concentrated in areas outside of suitable cactus habitat (72 FR 53214, September 18, 2007).

Predation: Parasitism by the cactus-borer beetle (*Moneilema semipunctatum*) is a significant but localized source of mortality to all *Sclerocactus* species on the Colorado Plateau, especially in larger, mature, reproducing individuals (Service 1990; 72 FR 53216, September 18, 2007). Parasitism is identified as a threat to *Sclerocactus* plants, however additional studies are needed to determine the long-term, population-level effects of the cactus-borer beetle to *S. brevispinus*.

Another source of mortality is lagomorph and rodent browsing. While there have been numerous observations of *Sclerocactus* being removed by desert cottontail rabbits (*Sylvilagus audubonii*) and unknown rodents (CNHP 2010b; BioLogic 2008; Clayton 2006), in subsequent years some of these plants have re-sprouted (Clayton 2010). Browsing likely goes unnoticed unless a marked individual is revisited within a 1- to 2-year period. We know very little about the magnitude of this threat.

Climate Change, Drought, and Impacts to the Vegetative Community: Climate change is likely to affect long-term survival of native species, including *S. brevispinus*, especially if longer or more frequent droughts occur. For the southwestern region of the United States, warming is occurring more rapidly than elsewhere in the country with an increase of 1.5°F (0.8°C) since 1979 (Karl et al. 2009). Under lower emission scenarios temperature is expected to increase 5°F (2.8°C) and under higher emission scenarios temperature is expected to increase 10°F (5.6°C) by the end of the century, from the 1979

baseline (Karl et al. 2009). Other future projections for the southwest include more intense and longer-lasting heat waves, an increased probability of droughts that are worsened by higher temperatures, heavier downpours, increased flooding, and increased erosion (Karl et al. 2009, pp. 129-134). The levels of aridity of recent drought conditions and perhaps those of the 1950s drought years may become the new climatology for the southwestern United States (Seager et al. 2007).

Effects related to climate change (e.g., such as persistent or prolonged drought conditions, changes in community assemblages and the ability of nonnative species to succeed) may affect long-term persistence of *S. brevispinus*. While the potential impacts of climate change could be serious, improved projections are needed to better understand this potential threat.

S. brevispinus mortality due to drought is well documented (Service 1990; 72 FR 53217, September 18, 2007). Many dead *S. brevispinus* individuals were observed in the Uinta Basin after the severe drought of 1976 to 1977 (Service 1990). In addition, noxious weeds are often able to out-compete native species under drought conditions (Everard et al. 2010). Drought conditions could further hinder BLM's efforts to control noxious weeds and restore native vegetation, which is already difficult due to the extreme environment of the Uinta Basin (Service 1990; BLM 2005, 2008).

Pesticides: *S. brevispinus* lives in or near areas that receive herbicide and pesticide treatments to remove undesirable species, such as noxious weeds and insect pests (Service 1990). Individual cacti are likely to be directly affected by these chemicals, and indirectly by effects on pollinators or by movement of contaminated soils (Service 1990). However, specifics of the species' pollination biology are currently unquantified.

Vulnerability Related to Population Size and Distribution: *S. brevispinus'* small population size and restricted distribution means the species is vulnerable to extinction by natural processes or human disturbance (Ellestrand and Elam 1993; Levin et al. 1996). For example, random events causing population fluctuations or population extirpations become a serious concern when the number of individuals or the geographic distribution of the species is very limited. Similarly, a single human-caused or natural environmental disturbance could destroy the entire population. The species' slow reproductive rate also increases the risk of effects of stochastic events as it is unlikely that the species will be able to rebound quickly (e.g., exhibit a high rate of population growth), even if environmental conditions improved after such an event. Other issues related to this factor include loss of genetic variability, which may reduce a species ability to respond to changing environmental conditions, (Godt et al. 1996) and inbreeding depression, which can decrease fertility and survival rates (Levin et al. 1996). No information exists to indicate that the species' range and population numbers have been significantly larger than they are currently, except for recent documented losses due to oil and gas development and illegal collection.

Inadequacy of Existing Regulatory Mechanisms: We are not aware of any city, county or state laws, ordinances or zoning that provide for protection or conservation of the *S. brevispinus* or its habitat. Removal, damage, or destruction of plants on private lands is

not prohibited under the Act. Removal from Federal lands is prohibited without a permit, but can be allowed through consultation with the Service. Conservation needs of *S. brevispinus* are addressed through interagency consultation (section 7 requirements) typically between the Service, BLM, and Bureau of Indian Affairs (BIA). Through this process, conservation measures are implemented on a project-by-project basis to minimize the loss of individual cacti from oil and gas activities. These measures include preconstruction cactus surveys and a required buffer around individual cacti. For example, the Castle Peak/Eightmile Flat Oil and Gas Expansion Project Final Environmental Impact Statement included conservation measures to specifically protect *S. brevispinus* and its habitat (BLM 2005).

The BLM also has attempted to establish protected areas for *S. brevispinus*. The Pariette Wetlands Area of Critical Environmental Concern (ACEC) was established in 1994. The ACEC, intended to provide protection for this species, contains approximately 1,250 ha (3,086 ac) or 8 percent of the potential habitat of *S. brevispinus*. Management prescriptions for the ACEC state that the BLM will authorize no action in suitable habitat for threatened and endangered species if it would jeopardize the continued existence of the species or result in severe modification of the habitat (BLM 2008). Although the BLM Vernal Field Office Resource Management Plan designated the Pariette Wetlands ACEC as "no surface occupancy" for oil and gas development (BLM 2008), pre-existing lease rights still allow surface disturbance from oil and gas development within the ACEC (BLM 2005). As of November 2009, the ACEC contains one well for approximately every 30 ha (74 ac), with more development planned. The BLM is currently deferring approval of new wells and ancillary facilities located within the Pariette Wetlands ACEC until a master development plan is completed. In addition to the ACEC and project-specific protections such as cactus surveys, we need to establish consistent guidance and Resource Management Plan designations that provide adequate regulatory mechanisms over the longer term to protect large portions of the range of the *S. brevispinus*.

III. PRELIMINARY RECOVERY STRATEGY

A. RECOVERY PRIORITY NUMBER WITH RATIONALE

S. brevispinus is currently assigned a recovery priority number of 14C. This ranking was assigned to the Uinta basin hookless cactus complex. We recommend changing the ranking of *S. brevispinus* to 5C. This ranking recognizes that:

(1) *S. brevispinus* is a full species;
(2) it faces a high degree of threat;
(3) it has a low potential for recovery; and
(4) it is in conflict with development activities or other forms of economic activities.

The change from 14C to 5C recognizes the change from a low degree of threat to the Uinta basin hookless cactus complex to a high degree of threat to the range-limited *S. brevispinus*. The high degree of threat is based on its occurrence in a single population, the extent of energy development occurring across a majority of the species' range, high levels of unauthorized collection, and inadequacy of existing regulatory mechanisms.

Table 2. Recovery Priorities

Degree of Threat	Recovery Potential	Taxonomy	Priority	Conflict
High	High	Monotypic Genus	1	1C
		Species	2	2C
		Subspecies/DPS	3	3C
	Low	Monotypic Genus	4	4C
		Species	5	**5C**
		Subspecies/DPS	6	6C
Moderate	High	Monotypic Genus	7	7C
		Species	8	8C
		Subspecies/DPS	9	9C
	Low	Monotypic Genus	10	10C
		Species	11	11C
		Subspecies/DPS	12	12C
Low	High	Monotypic Genus	13	13C
		Species	14	14C
		Subspecies/DPS	15	15C
	Low	Monotypic Genus	16	16C
		Species	17	17C
		Subspecies/DPS	18	18C

Recovery potential is low because this species is a narrow endemic, and it is restricted to specific soil types with little potential for population expansion or reintroduction. Climate change also may be an issue in species' recovery, but improved projections are needed to better understand this potential threat.

Further data from studies on pollinator biology, complete surveys of the species across its entire range, and long-term demographic and monitoring studies could favorably influence the recovery priority number. Therefore, we will review this recovery priority number during the recovery planning process and annually as new data become available.

B. RECOVERY VISION

We envision recovery for *S. brevispinus* includes sizable, stable populations maintained on conserved suitable habitat, with acceptable levels of connectivity between subpopulations for pollinator movement, gene flow, and seed dispersal. Populations will

be maintained to provide sufficient representation, resiliency, and redundancy to ensure a high probability of survival for the foreseeable future. Meeting these goals will require that threats be sufficiently understood and abated. Range-wide monitoring will be required.

C. INITIAL ACTION PLAN

Recovery needs for *S. brevispinus* include: (1) surveying to accurately document populations and suitable habitat; (2) protecting and restoring habitat including pollinator habitat, and corridors to provide connectivity; and (3) protecting individual plants and populations from direct and indirect threats. Specific actions include:

Surveys and Monitoring

- Completion of a comprehensive survey throughout the species range, including areas that are not likely to be disturbed. Survey results will provide an accurate population estimate and allow us to identify core population areas so we can more effectively protect the species. This effort will require evaluation of habitat components likely to support *S. brevispinus*.
- Surveys also should more accurately delineate *S. brevispinus* range and morphology relative to other *Sclerocactus* species.
- Locate possible population connectivity corridors.
- Continue ongoing monitoring efforts and expand monitoring to include a larger and more representative sample of occupied sites. This data should improve our understanding of trends.

Threats Abatement

- Identify sites in urgent need of habitat protection, set protection priorities, and implement protective measures. In the long run, land management agencies should establish formal land management designations to provide for long-term protection of important populations and habitat.
- Oil and gas leasing and other mineral extraction activities should avoid occupied sites and other important habitat when possible.
- Implement standard conservation measures to minimize future project and use impacts.
- Coordinate with land management agencies, project proponents, and other partners early in the planning process to limit direct and indirect impacts of planned activities.
- Install livestock exclosures for both protection and monitoring purposes in locations that will not be prone to illegal collection.
- Prevent the collection of *S. brevispinus* plants from natural populations.

Research

- Continue research into *S. brevispinus* life history and ecology, including soil requirements and pollinators.

- Study population dynamics and conduct a population viability analysis.
- Encourage investigations that project *Sclerocactus* species' vulnerability and response to climate change.
- Coordinate with *Sclerocactus* genetic and taxonomic experts.
- Establish revegetation techniques for disturbed habitat.
- Improve our understanding of livestock and native (e.g., rodent) grazing impacts.
- Monitor *Moneilema semipunctatum* infestations, and study the relationship of episodic infestations with drought and other environmental factors.
- Monitor changes in invasive species prevalence and impacts on *S. brevispinus*. Additionally, continue to explore approaches to minimize the risk posed by invasives and associated remediation actions.

IV. PREPLANNING DECISIONS

A. PLANNING APPROACH

A recovery plan will be prepared for *S. brevispinus* pursuant to section 4(f) of the Act. The recovery plan will include objective, measurable criteria which, when met, will result in a determination that the species be removed from the Federal List of Endangered and Threatened Plants. Recovery criteria will address all threats meaningfully impacting the species. The recovery plan will estimate the time and costs required to carry out those measures needed to achieve the goal of recovery and delisting. This plan will be a single species plan.

Plan preparation will be under the stewardship of Utah Ecological Services Field Office. At the present time, this species does not warrant the appointment of a recovery team. The Service will coordinate recovery efforts with an informal network of experts and involved parties (see Stakeholder Involvement below). A recovery team may be formally appointed at a later date, if deemed necessary. Periodically, meetings among these parties may be convened for the species with the purpose of sharing information and ideas about advancing *S. brevispinus* recovery.

B. INFORMATION MANAGEMENT

General: All information relevant to recovery of *S. brevispinus* will be housed in administrative files found at our Utah Ecological Services Field Office in West Valley City, Utah. The lead botanists will be responsible for maintaining the official record for the recovery planning and implementation process. Copies of new study findings, survey results, records of meetings, comments received, and other relevant information should be forwarded to this office (see Listing and Contact Information section above).

Reporting requirements: Information needed for annual accomplishment reports, the Recovery Report to Congress, expenditures reports, and implementation tracking should be forwarded to this office (see Listing and Contact Information section above). Copies of the completed reports can then be disseminated to all contributors upon request.

C. RECOVERY PLAN PRODUCTION SCHEDULE

The following dates are dependent on personnel and funding being available to complete the recovery planning process.

- Internal review draft: December 2011
- Public review draft: April 2012
- Public comment period ends: July 2012
- Final plan: December 2012

D. STAKEHOLDER INVOLVEMENT IN THE RECOVERY PROCESS

Possible Stakeholders:

- Public land managers with *S. brevispinus* on their lands, including representatives of BLM (Vernal Field Office and Utah State Office), and Tribal landowners and agencies (for example Uinta and Ouray Indian Reservation, Tribal Business Commission);
- Bureau of Indian Affairs (BIA);
- State land managers (SITLA);
- Conservation organizations such as The Nature Conservancy and the Center for Plant Conservation and cooperating institutions including Red Butte Gardens ;
- Scientific researchers such as Utah State University, the U.S. Geological Survey, and the U.S. Department of Agriculture's Rocky Mountain Research Station;
- Representatives of Utah conservation programs;
- Town and county officials for Duchesne and Uintah counties, Utah;
- Representatives from energy corporations;
- Uinta Basin environmental consultants; and
- Individuals with livestock grazing leases and affiliated livestock industry organizations.

Stakeholder Involvement Strategy: Early in the recovery planning process, we will hold a meeting of individuals working with *S. brevispinus* to exchange status information and identify recovery issues. Information emanating from this discussion will help shape the initial draft for the recovery plan. We will reach out to the above potential stakeholder groups to facilitate involvement of all interested parties. When needed, we

will hold additional meetings and/or conference calls to discuss particular issues. We will invite targeted stakeholders to participate in these meetings and calls when relevant for purposes of recovery planning. We will take advantage of all opportunities to interact with stakeholders in a productive and meaningful way. Stakeholders also may be asked to contribute directly in developing implementation strategies for planned actions.

Approve: Richard A. Coleman Date 4/14/10

Acting Regional Director, Region 6

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