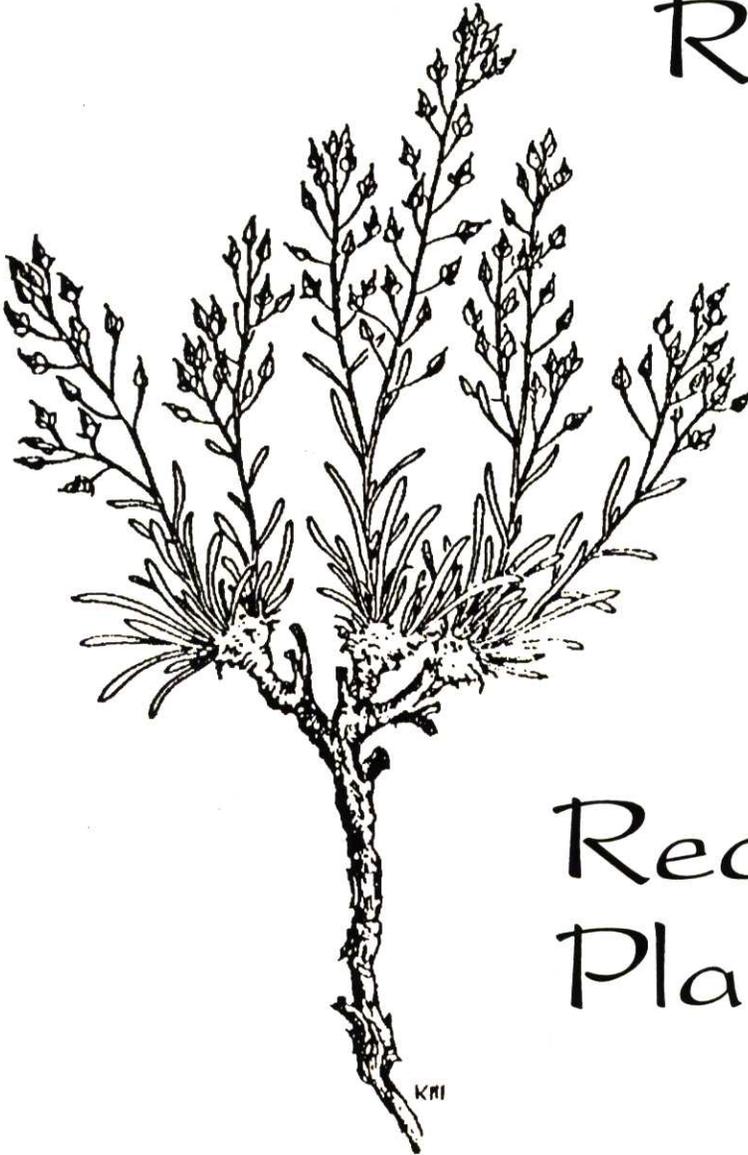


# Barneby Ridge-cress



## Recovery Plan

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U. S. Fish &  
Wildlife Service  
Region 6  
1993



BARNEBY RIDGE-CRESS

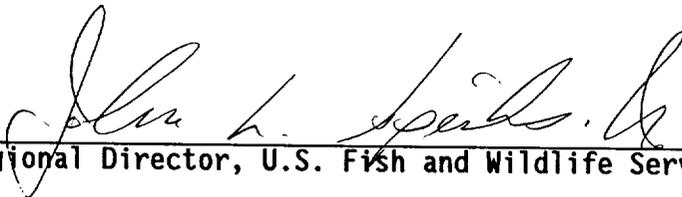
LEPIDIUM BARNEBYANUM

RECOVERY PLAN

Prepared by

Region 6, U.S. Fish and Wildlife Service

Approved:

  
Regional Director, U.S. Fish and Wildlife Service

Date:

23 July 1993

## DISCLAIMER

Recovery plans delineate reasonable actions that are believed to be required to recover and/or protect the species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, and others. Objectives only will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Recovery plans do not necessarily represent the views or the official positions or approvals of any individuals or agencies, other than the U.S. Fish and Wildlife Service, involved in the plan formulation. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

Literature citation should read as follows:

U.S. Fish and Wildlife Service. 1993. Barneby ridge-cress (Lepidium barnebyanum) recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado. 14 pp.

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The fee for the plan varies depending on the number of pages of the plan.

## EXECUTIVE SUMMARY

**Current Status:** The Barneby ridge-cress (Lepidium barnebyanum) is known from one population with three distinct stands with a total range about 5 miles across on the Uintah and Ouray Reservation of the Ute Indian Tribe. The total population of L. barnebyanum is estimated to be about 5,000 individuals with an occupied habitat of less than 500 acres.

**Habitat and Limiting Factors:** L. barnebyanum occurs in a very limited habitat of marly shale barrens underlain by petroleum deposits. The entire population of L. barnebyanum is experiencing or is vulnerable to off-road vehicle damage and is within a recently established oil and gas field. Continued unrestricted off-road vehicle use and future development of oil and gas wells and ancillary facilities could decimate L. barnebyanum populations and lead to the species extinction.

**Recovery Objective:** Short-term Objective--preventing the extinction and serious habitat degradation of L. barnebyanum. Long-term Objective--downlisting L. barnebyanum to threatened. The species eventual recovery and delisting is uncertain.

**Short-term Recovery Criteria:** Prevention of the species extinction can be accomplished through (1) maintaining the existing stands and population numbers, through sections 7 and 9 of the Endangered Species Act or (2) establishing formal management designations for each of the three populations to ensure their continued long-term protection.

**Long-term Recovery Criteria:** Downlisting of the species may be considered when the short-term criteria above are met and when (1) a total population of 20,000 L. barnebyanum individuals is documented for 5 years and (2) five separate stands of at least 2,000 individuals each are maintained and have been demonstrated to be at minimum viable population level with formal land management designations in place to protect the species and its habitat.

**Actions Needed:** (1) control activities that affect the habitat of L. barnebyanum through sections 7 and 9 of the Endangered Species Act and other relevant laws and regulations, (2) inventory suitable habitat for L. barnebyanum and determine with a reasonable degree of accuracy the population and distribution of the species, (3) establish and conduct minimum viable population studies on at least three different populations of L. barnebyanum, (4) document the presence of or, if necessary, establish formal land management designations that would provide for long term, undisturbed habitat for L. barnebyanum, and (5) develop public awareness, appreciation, and support for the conservation of L. barnebyanum.

**Date of Recovery:** Short-term recovery is anticipated by the year 2005. The date for long-term recovery is unknown.

**Total Cost of Recovery:** Unknown

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## I. INTRODUCTION

The total known population of the Barneby ridge-cress (Lepidium barnebyanum) occurs on the Uintah and Ouray Reservation of the Ute Indian Tribe. The U.S. Fish and Wildlife Service (Service) will coordinate all recovery activities for L. barnebyanum on the Uintah and Ouray Reservation with the Ute Indian Tribe. The Service requests the cooperation of the Ute Indian Tribe, and will assist the Ute Indian Tribe in the conservation of L. barnebyanum and its habitat. No introductions of new populations of the species will be initiated without the explicit written permission of the Business Committee of the Ute Indian Tribe. Special land use designations can be established only by the Business Committee. This plan does not commit the Ute Indian Tribe to participate in the recovery of the species.

### A. Description

The Barneby ridge-cress (L. barnebyanum Reveal) was listed as an endangered species under the authority of the Endangered Species Act, as amended, on September 28, 1990 (55 F.R. 39860). L. barnebyanum has a recovery priority of 5C, which indicates it is a species with a high degree of threat and a low recovery potential for which there are conflicts with economic activities. L. barnebyanum was first discovered by Rupert Barneby in 1947. Hitchcock (1950) described this plant as Lepidium montanum ssp. demissum. Reveal (1967) reviewed the type specimen of L. m. demissum and obtained additional specimens of that taxon from the type locality. As a consequence of his evaluation of this taxon, Reveal described the mustard as L. barnebyanum.

Lepidium barnebyanum is a perennial, herbaceous plant in the mustard family (Brassicaceae). It is approximately 5 to 15 centimeters (cm) (2 to 6 in.) tall and usually forms raised clumps or cushions (pulvinate growth form) up to 20 cm (8 in.) wide. The species arises from a deep woody taproot; its stems are smooth and hairless with narrow leaves clustering at the base of the plant. The species cream-colored flowers are about 5 to 7 millimeters (mm) (0.25 in.) across and alternate along a stem rising 2.5 to 6 cm (1 to 2.5 in.) above the base of the plant. The flowers begin to bloom in early May. L. barnebyanum seeds are quite small, about 1 mm (0.04 in.) across, and are borne in elliptical seed pods called silicles, which are about 4 to 5 mm (0.2 in.) long. The seeds are shed beginning in June and continuing into July (Reveal 1967; Welsh and Reveal 1977; Welsh et al. 1987)

### B. Distribution

Lepidium barnebyanum occurs in a discontinuous series of marly shale barrens on three ridgelines at an elevation of 1,890 to 1,980 meters (6,200 to 6,500 feet) on either side of Indian Creek about 5 kilometers (km) (3 miles) south of Starvation Reservoir and the town of Duchesne, Utah. The species is known from one population with three distinct stands with a total range of about 8 km (5 miles) across on the Uintah and Ouray Reservation of the Ute Indian Tribe. The total population of L. barnebyanum is estimated to be about 5,000 individuals with an occupied habitat of less than 500 acres (see figure 1). The current species distribution is essentially the same as the historical distribution known from past records, although recent surveys have

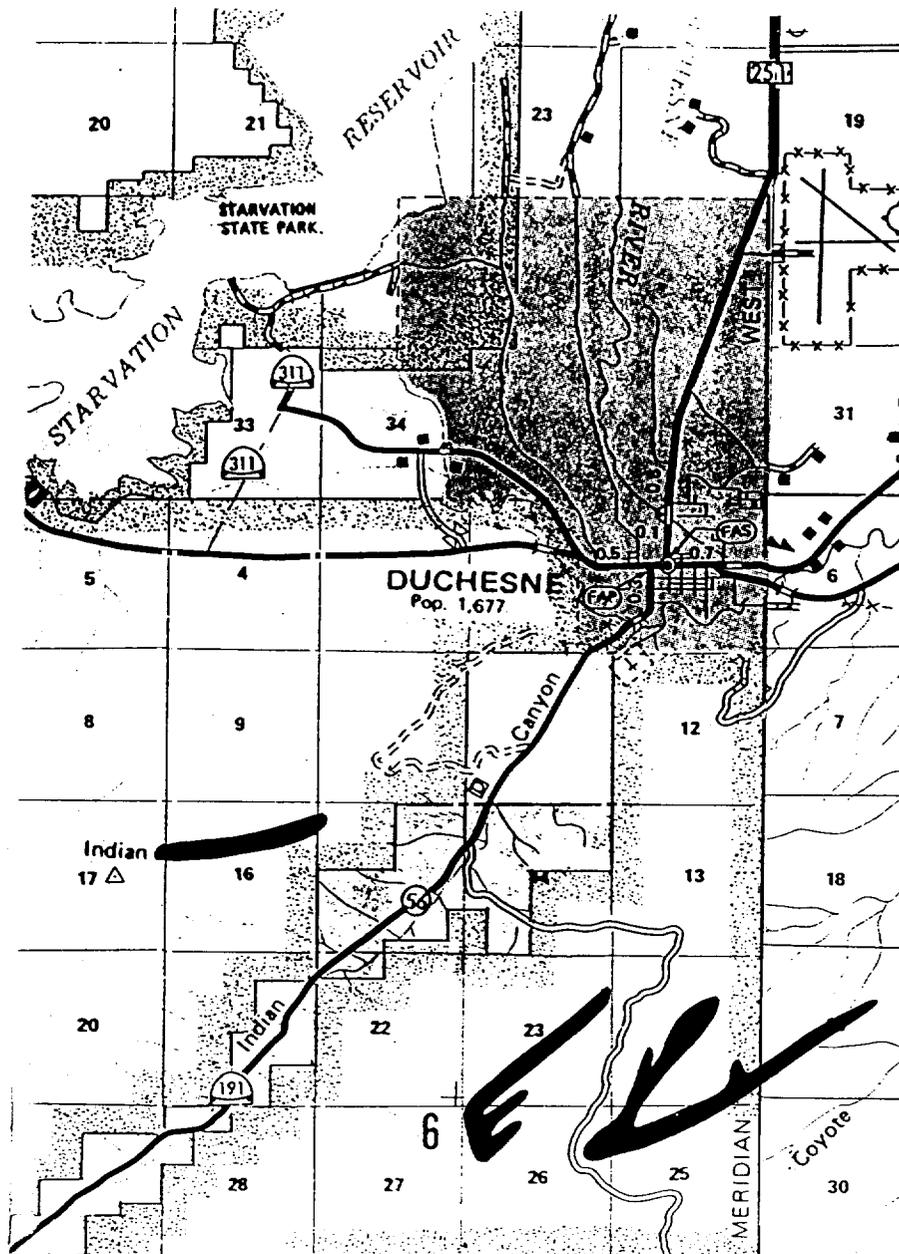


Figure 1  
 Distribution of Lepidium barnebyanum

slightly expanded the known distribution (Welsh 1978; Kung 1989; U.S. Fish and Wildlife Service 1989). There is no decline known in the distribution of the species; however, there has been some decline in species numbers due to damage from off-road vehicle activity.

### C. Population Biology

Lepidium barnebyanum reproduction is sexual. Flowering occurs from April to May and fruiting occurs May to June. The specific pollination mechanism and vectors are not known. The factors that govern the distribution of L. barnebyanum are not well known; also the long-term population dynamics are not well known.

### D. Habitat and Limiting Factors

The species habitat occurs at an elevation of 6,200 to 6,500 feet on poorly developed soils derived from marly shales in a zone of interbedding geologic strata from the Uinta and Green River Formations (Reveal 1967; Welsh and Reveal 1977; Welsh 1978; Welsh et al. 1987; U.S. Fish and Wildlife Service 1989).

The soil characteristics of L. barnebyanum habitat are not common within the species range, and effectively form "islands" of suitable habitat within a "sea" of unsuitable soil types derived from other differing geologic substrates. L. barnebyanum abundance and distribution is limited by its very restrictive habitat. The species is vulnerable to any event that could cause the local extirpation of one or more of its isolated stands within its only known population.

The vegetation of the shale barrens, on which L. barnebyanum occurs, is dominated by plant species with pulvinate growth forms, including: Hymenoxys acaulis, Arenaria hookeri, Townsendia mensana, Parthenium ligulatum, and L. barnebyanum itself. Other associated plant species include: Eriogonum batemanii, Astragalus spatulatus, and Castilleja scabrida. The shale barren pulvinate plant community of L. barnebyanum is a small inclusion within the broader pinyon-juniper woodland community, dominated by pinyon pine (Pinus edulis) and Utah juniper (Juniperus osteosperma), which characterize the general area (Welsh 1978; U.S. Fish and Wildlife Service 1989).

### F. Threats

Oil and gas exploration, drilling, and production, and off-road vehicle use are past, existing, and potential threats to the habitat of L. barnebyanum. The population of L. barnebyanum is underlain by petroleum deposits that are currently being developed. The entire population of L. barnebyanum is within recently established oil and gas fields. The potential for decimation of L. barnebyanum populations from petroleum resource development operations is a significant potential threat. The listing of the species, in itself, has protected the species by directing oil and gas development activities away from occupied habitat of the species.

Trampling from off-road vehicles and possibly livestock are also threats. Continued unrestricted off-road vehicle use and future development of oil and gas wells and ancillary facilities could lead to the species extinction unless appropriate measures are undertaken to protect this species and its habitat. The demographic stability of the L. barnebyanum population is not known. The effect of natural factors such as disease, parasitism, grazing by native species, natural erosion, and vegetative competition on the viability of the species population is not known. A candidate species, Erigeron untermannii, which occurs in similar habitat at higher elevations in the general vicinity, is subject to the same potential threats.

## II. RECOVERY

### A. OBJECTIVE AND CRITERIA

The primary objective of this recovery plan is to maintain a viable population of L. barnebyanum at its only known location. A secondary long-term objective is to initiate conservation and recovery measures which may lead to the species downlisting to threatened. It is unknown if removal of L. barnebyanum from the list of endangered and threatened species will eventually be possible.

The short-term objective of maintaining a viable population can be accomplished through (1) ensuring the protection of the current population and occupied habitat in all three stands through enforcing the conservation provisions of sections 7 and 9 of the Endangered Species Act, and (2) establishing formal land designations to conserve and protect the habitats at each of the three stands to assure their long-term protection from damage by off-road vehicle activities and from other impacts.

If the inherent vulnerability of the species is decreased to the point that localized threats will not jeopardize the species, the downlisting of L. barnebyanum may be possible. Downlisting of the species can be considered when conservation of this species population and natural habitat is sufficient to ensure the species continued existence as a viable self-sustaining population throughout the species known range. This may occur if (1) the species abundance and distribution is increased by identification of additional stands or by the introduction of additional stands into suitable habitat proximal to the known species range, if determined to be feasible, or (2) minimum viable population studies and other biological information indicates that the current species numbers and distribution is sufficient to maintain long-term species viability. Under these conditions, downlisting is anticipated to be possible when the short-term conditions described above are met and when (1) a total population of 20,000 L. barnebyanum individuals is documented for at least 5 years and (2) five separate stands of at least 2,000 individuals each are maintained and have been demonstrated to be at minimum viable population levels with formal land conservation designations in place to protect the species and its habitat. The number and size of stands needed to meet downlisting criteria will be verified in the future as more biological information becomes available.

The above objectives and criteria are subject to change as more information becomes available. The estimated date for accomplishing the short-term goal of preventing extinction of the species is the year 2005. The downlisting criteria provided above are preliminary, and it is unknown when downlisting can be achieved.

### B. STEPDOWN OUTLINE

1. Control activities that affect L. barnebyanum stands and habitats through sections 7 and 9 of the Endangered Species Act and other relevant laws and regulations.

- 1.1 Control mineral development activities.
  - 1.2 Control off-road vehicle use and recreational impacts.
  - 1.3 Control other activities that may affect the species.
  2. Inventory suitable habitat for L. barnebyanum and determine with a reasonable degree of accuracy its population and distribution.
  3. Establish and conduct a minimum viable population study on each of the three stands of L. barnebyanum.
  4. Establish formal land conservation designations to provide for long-term protection of the habitat at each of the three stands of L. barnebyanum.
  5. Conduct life history research.
  6. Propagate individuals in horticultural facilities.
  7. Establish new stands.
  8. Develop public awareness, appreciation, and support for the conservation of L. barnebyanum.
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#### C. NARRATIVE

1. Control activities that affect L. barnebyanum stands and habitats through sections 7 and 9 of the Endangered Species Act and other relevant laws and regulations.

The entire known habitat of L. barnebyanum occurs on the Uintah and Ouray Reservation of the Ute Indian Tribe. Indian reservations are Federal lands held in trust for specific Indian Tribes that have a wide latitude of management prerogatives for those reservations. The Federal Government assists the Indian Tribes in the management of Indian reservations through the Bureau of Indian Affairs (BIA).

Section 7(a) of the Act, as amended, requires Federal Agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened. Regulations implementing this interagency cooperation provision of the Act are found at 50 CFR 402. Section 7(a)(1) requires that all Federal Agencies actively conserve listed species. Section 7(a)(2) requires Federal Agencies to ensure that activities the Agencies authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal Agency must enter into formal consultation with the Fish and Wildlife Service (Service).

Activities undertaken, permitted, or funded by BIA and the Bureau of Land Management (BLM) on the Uintah and Ouray Reservation have the potential to affect L. barnebyanum. Both Agencies are required to consult with the Service whenever their proposed activities may affect this species or its habitat.

1.1 Regulate and control mineral development activities.

Lepidium barnebyanum was listed as an endangered species in part because of the potential of oil and gas development actions adversely impacting this species. The BIA and BLM will be the Federal Agencies primarily responsible to ensure that these mineral development activities do not adversely affect L. barnebyanum.

Mineral and energy leasing and development activities on the Uintah and Ouray Reservation are administered by the Ute Indian Tribe with assistance from BIA. The BLM is responsible for reviewing and authorizing proposed operations on a leasehold within the reservation, regardless of whether the lease is Indian or Federal. Both of these Federal Agencies would be responsible for ensuring that land actions in general, and those associated with mineral leasing and development specifically, are not likely to jeopardize the continued existence of L. barnebyanum. Both Federal Agencies are required to consult with the Service whenever mineral development activities under their jurisdiction may affect this species or its habitat.

The rate of oil and gas development activities in the range of L. barnebyanum has been variable; currently oil and gas wells are being developed within the range of L. barnebyanum. The specific siting of these wells and other oil and gas field support features such as roads, pipelines, and storage farms have the potential to impact this species. The BIA and BLM, as part of their right-of-way and drilling permitting programs, require an on-the-ground examination of all phases of oil and gas development that could impact a listed threatened or endangered species, such as L. barnebyanum, and require oil and gas development activities to avoid individual threatened and endangered plants.

1.2 Control off-road vehicle use and recreational impacts.

At present off-road vehicle use on the habitat of L. barnebyanum is variable. However, with possible human population increases in the region and with increasing popularity and availability of off-road vehicles, off-road vehicle use is expected to increase. This reasonably can be expected to result in an increase in damage to the habitat of L. barnebyanum. The Ute Indian Tribe has declared its tribal lands off limits to off-road vehicle use. The Ute Indian Tribe should develop and implement a plan to prevent off-road vehicle use on L. barnebyanum habitat. Damage

or destruction of listed endangered plant species committed by an act which is in violation of local or State laws or regulations, including criminal trespass laws, would also be a violation of section 9 of the Endangered Species Act. The Service will assist the Ute Indian Tribe and BIA, as appropriate, in the enforcement of laws and regulations that protect the habitat and population of L. barnebyanum.

1.3 Control other activities that may affect the species.

The monitoring of the L. barnebyanum population will enable the identification of other factors affecting the species population. When and if these factors are identified, they will be evaluated and action implemented to prevent adverse impact to the species population.

2. Inventory all suitable habitat for L. barnebyanum and determine with a reasonable degree of accuracy its population and distribution.

An inventory of all suitable habitat is needed to identify habitats and stands necessary to ensure the long-term survival of the species. The inventory should include surveys on age class distribution, documentation of habitat losses and population increase or reduction for each population, and the impact of trampling, grazing, disease, parasitism, etc. on the species. This activity should be conducted by the Ute Indian Tribe and BIA, and other land managing agencies in the vicinity of the species population, with assistance from the Service. The Utah Natural Heritage Program also may provide assistance in conducting this inventory.

3. Establish and conduct a minimum viable population study on each of the three stands of L. barnebyanum.

Minimum viable population studies will document demographic stability of the species population. A minimum viable population is defined as a demographically stable population that is large enough to maintain genetic variation and to enable it to evolve and successfully respond to natural environmental variation (Menges 1986). If, as a consequence of these studies, other factors, natural or man-caused, are identified as possibly having a detrimental effect on the species population that would preclude its eventual delisting, those factors will be addressed and the recovery plan revised to accommodate them. Little is known concerning natural threats such as disease, parasitism, and grazing by native species on Lepidium barnebyanum. No known diseases have been reported in this species. Moderate to heavy domestic livestock grazing has been observed to cause physical damage to L. barnebyanum plants through trampling. Erosion and vegetative competition from exotic (and some native) species as a result of an overgrazing disclimax may adversely affect L. barnebyanum. It is not known if the stands of L. barnebyanum are at levels that will ensure long-term demographic and genetic viability. This study may be

conducted by the Service, the Ute Indian Tribe, and/or BIA or other affected land managing agency. The Utah Natural Heritage Program also may provide assistance in conducting this study.

4. Establish formal land conservation designations to provide for long-term protection of the habitat at each of the three stands of *L. barnebyanum*.

Formal land designations should be established to conserve *L. barnebyanum* stands and habitats. Designations such as Research Natural Areas, Areas of Critical Environmental Concern, designated Wilderness natural preserves and parks, have been established on other State and Federal properties to conserve rare species and land resources. The Ute Indian Tribe should consider establishing similar special protected areas to ensure the long-term protection of each of the three stands of *L. barnebyanum* and their habitats. Such designations also may need to be established on any additional stands that may be discovered in the future on the Uintah and Ouray Reservation, or on adjacent Federal properties, to ensure the species survival as a vigorous reproducing species into the future.

5. Conduct life history research.

Various types of research may be needed to determine any unidentified factors limiting the current population. The specific research needed has not yet been identified, but may include studies on pollination, soil preferences, and habitat requirements. Assistance to the Service in conducting this research may be provided by BLM, BIA, the Ute Indian Tribe, the Utah Natural Heritage Program, or the Center for Plant Conservation.

6. Propagate individuals in horticultural facilities.

Individual living specimens of *L. barnebyanum* currently are being housed at the Denver Botanical Garden (a member facility of the Center for Plant Conservation) for the purpose of maintaining a refuge population of the species and for conducting future research beneficial to the species recovery, including techniques necessary for the establishment of additional populations in suitable habitat. Some horticultural assistance also may be provided by the Ute Indian Tribe, if feasible. Additional specimens may need to be collected to represent the entire genetic base of the species. Any additional collections on the Uintah and Ouray Reservation need to be coordinated with the Ute Indian Tribe.

7. Establish new stands.

New stands may be introduced into, or proximal to, the species current range if suitable habitat is found, and if such introduction is determined to be feasible (i.e., there is a sufficient survival rate and the introduced stand is expected to become self-sustaining). This may occur on lands managed by the Ute Indian Tribe or on nearby lands

under the jurisdiction of BLM. No populations will be introduced onto Ute Indian Tribal lands without written permission for the introduction of such populations from the Ute Indian Tribal Business Council.

8. Develop public awareness, appreciation, and support for the conservation of *L. barnebyanum*.

Education is a vital part of the recovery process. The cooperation of the Ute Indian Tribe, and of the general public, is essential in the ultimate success of the above recovery measures. This can be started with educational programs such as pamphlets and audiovisual programs for use by the Ute Indian Tribe or for use in schools and groups interested in conservation. The introduction and maintenance of *L. barnebyanum* in recognized botanical gardens will assist in both public education of the significance and importance of this species, and will provide for a reserve of seeds and plants for reintroduction into the wild should wild populations be lost. The Service will be primarily responsible for this activity, with assistance from the Ute Indian Tribe, public and private conservation groups, and land managing agencies.

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### III. IMPLEMENTATION SCHEDULE

The implementation schedule that follows outlines actions and costs for the recovery program. It is a guide for meeting the objectives elaborated under the recovery section of this plan. This schedule indicates task priorities, task numbers, task description, duration of tasks ("ongoing" denotes a task that once begun should continue on an annual basis), the responsible agencies, and lastly, estimated costs. These actions, when accomplished, should bring about the recovery of L. barnebyanum and protect its habitat.

Priorities in column one of the following implementation schedule are assigned as follows:

1. Priority 1--an action that must be taken to prevent extinction of, or to prevent the species from declining irreversibly in the foreseeable future.
2. Priority 2--an action that must be taken to prevent a significant decline in species population/habitat quality or some other significant, negative impact short of extinction.
3. Priority 3--all other actions necessary to meet the recovery objective.

#### Key to Acronyms used in Implementation schedule

UT - State of Utah, including the Utah Natural Heritage Inventory  
UIT - Ute Indian Tribe  
BIA - Bureau of Indian Affairs  
BLM - Bureau of Land Management  
CPC - Center for Plant Conservation  
FWS - Fish and Wildlife Service  
ES - Fish and Wildlife Enhancement  
LE - Law Enforcement

Lepidium barnebyanum (Barneby ridge-cress) Recovery Implementation Schedule

Priority	Task	Task Description	Task Duration	Responsible Party			Cost Estimates			Comments
				FWS		Other	FY-01	FY-02	FY-03	
				Region	Program					
1	1.1	Control mineral development activities	ongoing	6	ES	BIA, BLM, UIT	2,000	2,000	2,000	
1	1.2	Control ORV activity	ongoing	6	ES, LE	BIA, UIT				cost included in task 1.1
2	1.3	Control potential activities	ongoing	6	ES	BIA, UIT				cost included in task 1.1
2	2	Inventory suitable habitat	3 years	6	ES	BIA, BLM, UIT, UT	4,000	4,000	4,000	
2	3	Establish and conduct MVP studies	9 years	6	ES	BIA, BLM, UIT, UT	2,000	2,000	2,000	
2	5	Conduct life history research	5 years	6	ES	UIT, UT, CPC	5,000	5,000	5,000	
3	4	Habitat conservation designations	ongoing	6	ES	UIT, BIA				
3	6	Propagate plants in horticultural facilities	ongoing	6	ES	UIT, CPC	2,000	1,000	1,000	
3	7	Establish new stands	5 years	6	ES	BIA, BLM, UIT				costs cannot be determined at this time
3	8	Develop public awareness	ongoing	6	ES	BIA, UIT, CPC, UT, BLM	2,000	2,000	2,000	

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This recovery plan was made available to the public for comment as required by the 1988 amendments to the Endangered Species Act of 1973. The public comment period was announced in the Federal Register (57 F.R. 9745) on March 20, 1992, and closed on May 19, 1992. Approximately 80 press releases were sent to the print media located in Utah.

During the public comment period, six comment letters were received. The comments provided in these letters have been considered and incorporated as appropriate. Comments addressing recovery tasks that are the responsibility of an agency other than the U.S. Fish and Wildlife Service have been sent to that agency as required by the 1988 amendments to the Act.