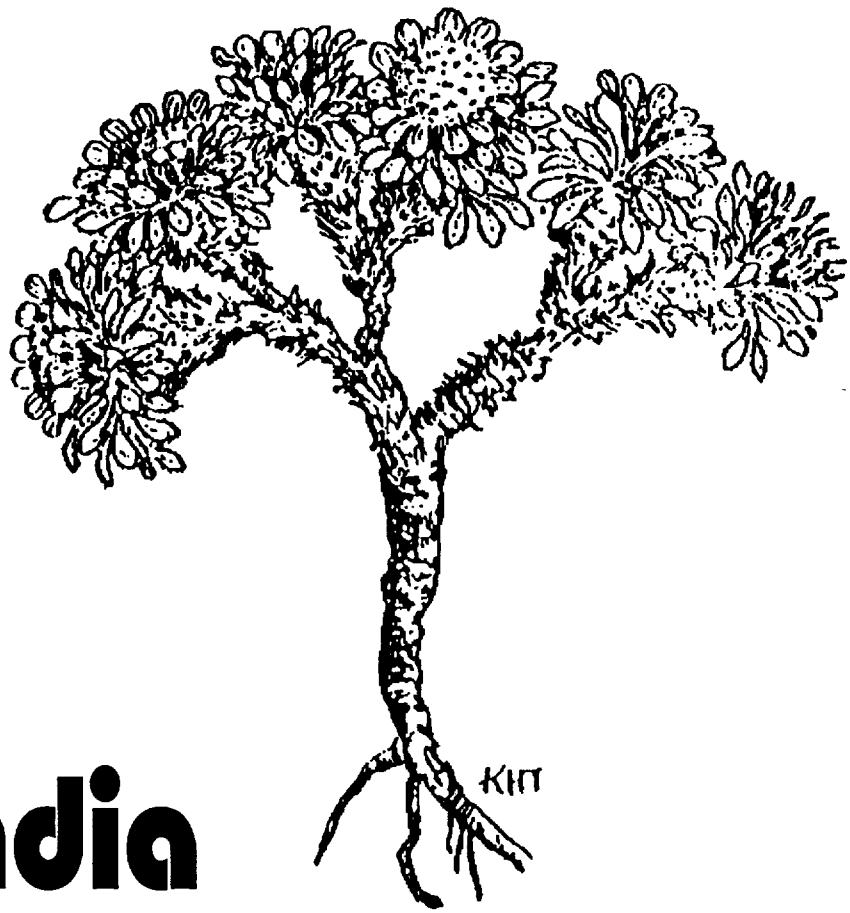

Last Chance Townsendia Recovery Plan

U. S. Fish & Wildlife Service
Region 6
1993

LAST CHANCE TOWNSENDIA

TOWNSENDIA APRICA

RECOVERY PLAN

Prepared by

Region 6, U.S. Fish and Wildlife Service

Approved: _____
Deputy Regional Director, U.S. Fish and Wildlife Service

Date: 20 August 1985

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 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 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:

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EXECUTIVE SUMMARY

Current Status: Townsendia aprica is currently known from a series of small populations most of which are in a band less than 5 miles (8 km) wide and 30 miles (48 km) long in Emery, Sevier, and Wayne counties, Utah. Currently 15 separate populations are known, with numbers ranging from 6 to approximately 2,000 individuals. Most species occurrences are less than an acre in size. The total known population is estimated at approximately 6,000 individuals.

Recovery Objective: The listing of T. aprica as threatened provides the recognition and protection necessary to ensure the species survival in the foreseeable future. Protection of all existing populations and their habitats is necessary to conserve the species and prevent its further decline. Recovery, and eventual delisting, of the species may be accomplished through the discovery or establishment, if feasible, of additional populations and the maintenance of the species total population at viable population levels.

Delisting Criteria:

1. Maintain a documented total population of 30,000 T. aprica individuals for 5 consecutive years.
2. Maintain 20 populations of at least 500 individuals each, which have been demonstrated to be at minimum viable population levels.
3. Establish formal land management designations for these populations that provide long-term, undisturbed habitat for T. aprica.

Actions Needed:

1. Ensure that T. aprica and its habitat is protected from loss of individuals and environmental degradation of its habitat through sections 7 and 9 of the Endangered Species Act.
2. Inventory suitable habitat for T. aprica 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 six different populations of T. aprica.
4. Reintroduce additional populations of T. aprica in suitable habitat within its historic range, if such reintroduction is determined to be appropriate and feasible.
5. Document the presence of or, if necessary, establish formal land management designations that would provide for long-term protection for T. aprica and its habitat.
6. Develop public awareness, appreciation, and support for the conservation of T. aprica.

Date of Recovery: 2005
Total Cost of Recovery: unknown

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I. INTRODUCTION

The Last Chance townsendia, Townsendia aprica Welsh and Reveal, was listed as a threatened species under the authority of the Endangered Species Act, as amended, on August 21, 1985 (50 F.R. 33734). This species has been given a recovery priority of 5C, which indicates it is a species with a high degree of threat and a low recovery potential that may be in conflict with economic activity.

A. Description

Townsendia aprica is a low-growing perennial, herbaceous plant in the composite family (Asteraceae). The species is stemless, with its leaves and flowers borne at ground level. Its narrow leaves are about 0.5 inches (1.2 cm) long. The flower has orange-yellow rays (apricot colored, hence the scientific specific name: aprica). The corolla disk is about 1 inch (2.4 cm) across (Welsh and Reveal 1968).

Townsendia aprica is a member of a small genus of about 25 species as currently recognized in botanical literature (Beaman 1957, Reveal 1970, Shultz and Holmgren 1980, and Welsh 1983a). All species are from Western North America, with most from the interior highlands of the Western United States. Thirteen species of Townsendia are native to Utah (Reveal 1970, Welsh 1983a, and Welsh et al. 1987). T. aprica is one of the more distinctive members of its genus. Its yellowish flowers distinguish it from all other species of Townsendia except T. jonesii. var. lutea, a rare and restricted variety of T. jonesii whose range is close to that of T. aprica, about 25 miles (40 km) to the west on the opposite side of the Wasatch and Fish Lake Plateaus (Welsh and Reveal 1968, Reveal 1970, Welsh 1983b, and Armstrong and Thorne 1991).

B. Distribution

Townsendia aprica is currently known from a series of small populations in Emery, Sevier, and Wayne counties, in central Utah. Most populations occur in a band about 5 miles (8 km) wide and 30 miles (48 km) long, beginning near Interstate 70 at the western edge of the San Rafael Swell in southwestern Emery County, west to near Fremont Junction in extreme eastern Sevier County, then south along the Emery-Sevier County line to the vicinity of Hartnet Draw in northcentral Wayne County. A few small isolated populations occur east and south of the main population group; one near the southern margin of the San Rafael Swell, one in the central portion of the San Rafael Swell, and one in the central portion of Capitol Reef National Park (see Figure 1). Being a recently discovered species, T. aprica's historical distribution is the same as its current known distribution.

Currently 15 separate populations are known with numbers ranging from 6 to approximately 2000 individuals (see table 1). Most populations are very small, about an acre (.4 hectares) in size. The total known population is estimated at 6000 individuals (Neese 1987; Heil 1987; Kass 1990, Armstrong and Thorne 1991; Duane Atwood, U.S. Forest Service, Ogden, Utah, pers. com. 1989). The majority of the populations of T. aprica are located on Federal lands

Figure 1

PRESENT DISTRIBUTION OF *TOWNSENDIA APRICA*

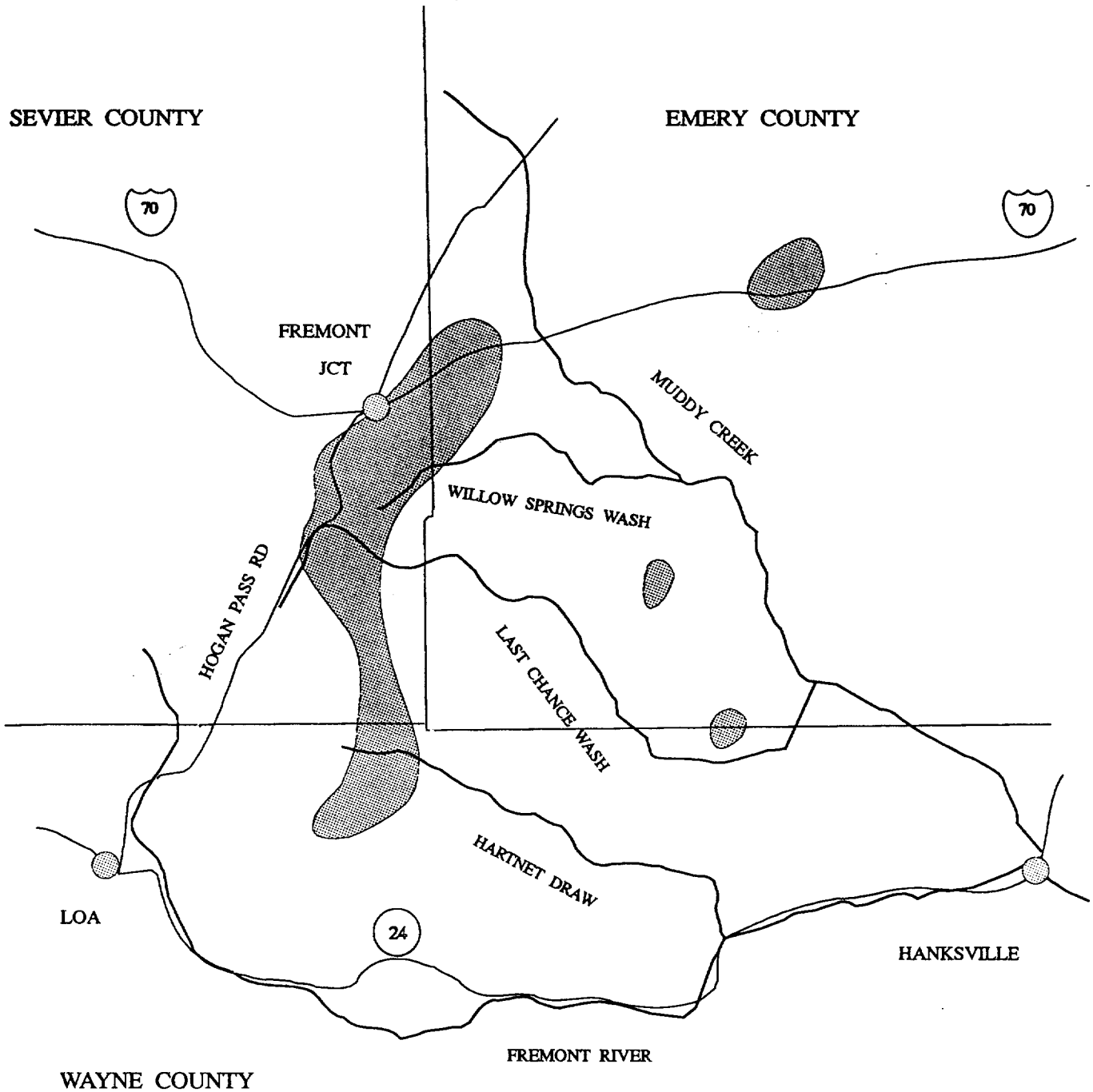

TABLE 1

Population name	Township and Range	Size*
1. upper Last Chance Creek (type locality)	T24S, R4E, Sec 36 T24S, R5E, Sec 30,31 T25S, R4E, Sec 1 T25S, R5E, Sec 1,5,6	ca. 2000
2. Dog Valley Wash (Dog Valley Mine)	T23S, R6E, Sec 18,19, 20,21,29,30,32,33	ca. 2000
3. Rock Canyon	T24S, R5E, Sec 1,2 T24S, R6E, Sec 4,5,6,7,8	ca. 500
4. Willow Springs	T24S, R5E, Sec 11,13,14 T24S, R6E, Sec 18	ca. 500
5. Post Hollow	T24S, R5E, Sec 7	6
6. Last Chance Ranch	T25S, R5E, Sec 15,22	ca. 10
7. Solomon's Temple	T25S, R5E, Sec 35 T26S, R5E, Sec 3	ca. 100
8. Jones Bench	T26S, R5E, Sec 16,17	ca. 40
9. Oil Well Bench	T26S, R7E, Sec 18	ca. 10
10. Segers Hole	T25S, R8E, Sec 34 T26S, R8E, Sec 2	ca. 20
11. East Cedar Mountain	T25S, R8E, Sec 16,18,19,30	ca. 50
12. Moore cutoff	T22S, R9E, Sec 20,29,30,32,33 T23S, R9E, Sec 4	ca. 100
13. The Hartnet	T27S, R5E, Sec 8,9,10,13,14,15	ca. 500
14. Deep Creek	T27S, R4E, Sec 25	ca. 100
15. Miners Mountain	T29S, R6E, Sec 29 T30S, R6E, Sec 11	ca. 200

*(all numbers are approximate pending the continued review and analysis of existing status information and continued habitat survey)

managed by the Bureau of Land Management (Moab and Richfield districts), with additional important populations located in Capital Reef National Park and Fish Lake National Forest.

C. Population Biology

Townsendia aprica reproduction is sexual. Flowering occurs from April to May and fruiting occurs May to June. The factors which govern the distribution of T. aprica are not well known, nor are the long-term population dynamics.

Self-pollination is virtually non-existent in Townsendia aprica. Pollination is accomplished by several species of solitary bees: eight species of metallic blue and green megachilid bees in the genus Osmia, and the anthophorid bee Tetralonia fulvitarsis. A few species of flies (not yet identified) also visit the flowers. Seed set seems frequently to be pollinator-limited. Lack of pollination may be due to various reasons including low pollinator numbers, inclement weather affecting pollinator flight activity, and possibly other unidentified factors (V. T. Tepedino & T. L. Griswold, USDA-ARS Bee Biology and Systematics Laboratory, Logan, Utah, pers. comm., 1991).

D. Habitat and Limiting Factors

Populations of T. aprica generally occur with galleta and salt desert shrubs in small barren openings of pinyon-juniper vegetative communities. Species commonly associated with T. aprica populations include: galleta (Hilaria jamesii), blue grama (Bouteloua gracilis), black sagebrush (Artemisia nova), shadscale (Atriplex confertifolia), snakeweed (Gutierrezia sarothrae), Indian ricegrass (Stipa hymenoides), and little rabbitbrush (Chrysothamnus viscidiflorus). Several other federally endangered plant species (Pediocactus despainii, Sclerocactus wrightiae, and Schoenocrambe barnebyi) and candidate or rare endemic plant species (P. winkleri, Gilia caespitosa, and G. tenuis) occur with, or in the immediate vicinity of T. aprica.

The surface geology in the area where T. aprica occurs is highly mixed and contains a wide variety of soils having unusual soil chemistries. Within this area, T. aprica occurs in a very restricted distribution of about 5 miles (8 km) wide and 30 miles (48 km) long. Most known T. aprica populations grow in soils derived from shale lens, that have a very fine silt texture and very high alkalinities and occur at the surface in small, isolated pockets. These pockets effectively form "islands" of suitable habitat within a "sea" of unsuitable geologic substrates with their resultant soil types. In the main portion of the species range, the soils in which the species occurs are derived from shale lens included in the Emery, Ferron, Blue Gate, Masuk, and Tununk members of the Mancos Formation. In the southern portion of the species range, the soils are derived from similar shale lens of the Curtis, Entrada, Morrison, and Summerville formations (Neese 1987 and Armstrong and Thorne 1991). The small, isolated T. aprica populations east of the main group, occur on white shale barrens of the Carmel formation (Kass 1990). Although T. aprica grows in association with several geological formations, it is limited to a small band within the shale derived soils of these formations, and has a very restricted distribution.

E. Threats

Because I. aprica is so restricted in its distribution, any event that could result in loss of individuals or habitat within one or more populations is a potential threat to the species survival. Threats to I. aprica come primarily from mineral and energy development, road building, and livestock trampling. Some population reduction already has occurred as a consequence of road building. Livestock grazing and energy development has altered and disturbed habitat typical of I. aprica and that may once have been occupied by I. aprica.

Coal mining activities have been, and continue to be, potential threats to I. aprica habitat. The majority of the populations of I. aprica are underlain by coal seams, some of which could be strip mined (Doelling and Smith 1983; Harris 1980). The potential for wholesale decimation of numerous I. aprica populations from coal mining operations is a significant potential threat. Although immediate impacts from oil and gas exploration, drilling, and production are not likely, it could be a potential threat to the species in the future.

Townsendia aprica was listed as a threatened species in part because of the potential for mining actions to adversely impact this species. The final rule listing this species (50 F.R. 33734) stated "Coal mining development and production, especially strip mining along the exposed coal seams in the Emery coal field, has [sic] the potential of impacting and possibly eradicating 95 percent of the total population of Townsendia aprica." Most of the habitat of Townsendia aprica under Federal ownership is or has been under lease for coal or oil and gas. Review of the species distribution and abundance suggests that about 50 percent of the area that harbors the species population is underlain by potentially developable coal resources (Earnest Eberhard, Bureau of Land Management, pers. comm. 1992).

The rate of coal mining in the Emery coal field has been at a low and consistent rate for the last 100 years (Doelling and Smith 1983). Most surface disturbance to the habitat of I. aprica has occurred in the vicinity of the Dog Valley mine near Fremont Junction. With the recent improvement of the Hogan Pass Road between Highway 24 in Wayne County and Interstate Highway 70 at Fremont Junction, the active development of the Emery coal field becomes more likely in the foreseeable future. Currently, however, there is little active interest in developing coal in this field. Mining in this coal field has the potential to devastate local populations of I. aprica through habitat disturbance and removal of upper soil layers.

Until recently, roads in the vicinity of known populations of Townsendia aprica were rough, narrow unimproved trails. However, Interstate Highway 70 from Fremont Junction through the San Rafael Swell to Green River, Utah was constructed through some of the northern populations of I. aprica and undoubtedly removed some plants. The recent improvement of the Hogan Pass Road required design modification to avoid impacting I. aprica and its habitat. Future road developments also may be potential threats to the species.

Damage to individual plants and to habitats from off-road vehicles and livestock are localized threats in some areas (Welsh 1978). The threats from off-road vehicles may increase with greater accessibility resulting from road development. I. aprica was listed in part because of the species' vulnerability to the effects of livestock grazing. Moderate to heavy domestic livestock grazing and trailing has been observed to cause physical damage to I. aprica plants through trampling. Erosion and vegetative competition from exotic (and some native) species as a result of an overgrazing may adversely affect I. aprica. Trampling by cattle also may have detrimental effects on populations of the ground-nesting bees responsible for the pollination of I. aprica.

The demographic stability of the various populations of I. aprica is not known; some populations may exist in numbers too small to sustain themselves long term. 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 also is not known.

II. RECOVERY

OBJECTIVE AND CRITERIA

The primary objective of this recovery plan is to maintain viable populations of Townsendia aprica throughout the current range of the species. The listing of T. aprica as threatened provides the recognition and protection necessary to ensure the species survival in the foreseeable future. Recovery and eventual delisting of the species will require protecting all existing populations and habitats from impacts of localized activities and maintaining the species total population at viable population levels. The discovery or establishment of additional populations also will be necessary to attain recovery.

Delisting criteria for T. aprica have been identified based on information currently available. As more information is available in the future, these criteria may be modified. These criteria assume a potential for increasing the numbers of plants within populations and discovering or establishing additional populations:

1. Maintain a documented total population of 30,000 T. aprica individuals for 5 consecutive years.

2. Maintain 20 populations of at least 500 individuals each, which have been demonstrated to be at minimum viable population levels.

3. Establish formal land management designations for these populations, which provide long-term, undisturbed habitat for T. aprica.

The above objective and criteria are subject to change as more information becomes available. The estimated date for recovery completion is 2005.

STEPDOWN OUTLINE

1. Manage activities that affect T. aprica and its habitat through section 7 of the Endangered Species Act and other relevant laws and regulations.

   1.1 Manage mineral development activities.

   1.2 Manage off-road vehicle use and recreational impacts.

   1.3 Manage roadbuilding and maintenance.

   1.4 Manage activities associated with livestock management.

2. Inventory suitable habitat for T. aprica and determine with a reasonable degree of accuracy its population and distribution.

3. Establish and conduct minimum viable population studies on T. aprica populations.

4. Conduct research on the biology and ecology of T. aprica.

5. Determine the horticultural requirements and establish garden populations of T. aprica.

6. Evaluate the need for the introduction of artificial populations into suitable habitat.

7. Establish formal land management designations that would provide for long-term protection of T. aprica habitat.

8. Develop public awareness, appreciation, and support for the conservation of T. aprica.

NARRATIVE

1. Manage activities that affect T. aprica and its habitat through section 7 of the Endangered Species Act and other relevant laws and regulations.

Most of the populations (and most of the known and potential habitat) of T. aprica occurs on federally managed public land under the jurisdiction of the Bureau of Land Management, although additional populations occur on lands under the jurisdiction of the Forest Service and the National Park Service. Activities that are conducted by or that come under the authorities of the Federal Highways Administration or the Office of Surface Mining Reclamation and Enforcement also could affect T. aprica. Under sections 7(a)(1) and 7(a)(2) of the Endangered Species Act, Federal Agencies are required to conserve endangered and threatened species and to consult with the Service when an Agency's actions may affect listed species. The Bureau of Land Management, National Park Service, Forest Service, Federal Highway Administration, and Office of Surface Mining Reclamation and Enforcement must conduct actions to conserve T. aprica and its habitat in order to comply with these sections of the Endangered Species Act.

All Federal activities, including mining, oil and gas field development, grazing, highway construction, etc., within or near T. aprica habitat will need to be reviewed by the Service through consultation under section 7 of the Endangered Species Act in order to avoid or minimize impacts on T. aprica and its habitat. The location and distribution of T. aprica populations are small and isolated enough so that virtually all proposed activities could, and should, be designed to avoid impacts to the species and its habitat.

Other laws and regulations that would assist Federal Agencies in the management of activities potentially affecting T. aprica include the Federal Land Policy and Management Act, under which the Bureau of Land Management administers lands under its jurisdiction with specific guidance regarding the management of threatened and endangered species in the BLM 6840 Manual, the National Forest Management Act, under which the Forest Service administers lands under its jurisdiction with specific guidance regarding the management of threatened and endangered species in the Forest Service 2670 Manual, the National Environmental Policy Act, and other Bureau of Land Management, Forest Service, and National Park Service regulations pertaining to surface management of Federal lands under U.S. Mining Laws.

1.1 Regulate and Manage Mineral Development Activities.

The Bureau of Land Management, Forest Service, Office of Surface Mining Reclamation and Enforcement, and the Utah Division of Oil, Gas, and Mining (through their administration of energy development activities on these Federal lands) are

the agencies primarily responsible to ensure that mineral development activities do not adversely affect this species as required under section 7 of the Endangered Species Act.

I. aprica was listed as a threatened species in part because of the potential for coal mining actions to adversely impact this species. The Bureau of Land Management and the Forest Service, as part of their coal leasing program, require an indepth environmental analysis of the impacts of coal resource development and require an on-the-ground examination of all phases of coal mining that could impact I. aprica individuals and habitats. In addition, the Office of Surface Mining Reclamation and Enforcement, through the Utah Division of Oil, Gas, and Mining, requires that coal mining activities are compatible with nonmineral resources, including threatened and endangered species, and requires that coal mining activities avoid impacts to individual threatened and endangered species. These agencies are required under existing laws to ensure that all coal mining activities do not adversely affect I. aprica.

The rate of oil and gas development activities near the range of Townsendia aprica have been extremely variable, increasing dramatically before the species was listed, then decreasing just as dramatically to the current low levels of activity. Oil and gas development activities could potentially devastate local populations of I. aprica through habitat disturbance and destruction. The Bureau of Land Management and the Forest Service, as part of their right-of-way and drilling permit programs, require an on-the-ground examination of all phases of oil and gas development that could impact I. aprica individuals and habitats. They require oil and gas development activities to avoid individual threatened and endangered plants. Other potential mineral development threats may occur from the exploration for and development of uranium and gypsum ore deposits within the range of the species.

1.2 Manage off-road vehicle use and recreational impacts.

At present, off-road vehicle use on I. aprica habitat is light. However, with possible human population increases in the region in which I. aprica occurs, and with increasing popularity and availability of improved off-road vehicles, off-road vehicle use is expected to increase. This can be expected to result in an increase in damage to the habitat of I. aprica. The Bureau of Land Management, Forest Service, and National Park Service should develop off-road vehicle use plans that prohibit off-road vehicle use on I. aprica habitat.

1.3 Manage road building and maintenance.

The recent improvement of the Hogan Pass Road from Fremont Junction to Loa, Utah, removed I. aprica plants and habitat at

the largest population at Last Chance Bench. The Hogan Pass Road has also increased the accessibility of most of the species populations to human disturbance (Federal Highway Administration 1985 and U.S. Fish and Wildlife Service 1985). Future road improvement and construction activities could impact additional populations of this species. The Bureau of Land Management, Forest Service, National Park Service, and Federal Highway Administration will need to ensure that road improvement or construction activities they conduct, permit, or fund avoid I. aprica and its habitat.

1.4 Manage activities associated with livestock management.

Livestock grazing can be detrimental to I. aprica and its habitat in various ways, through physical damage to the plants (caused by trampling), soil disturbance, erosion, modification of native vegetation communities, and declines in survivability of pollinators. The Bureau of Land Management, Forest Service, and National Park Service are responsible for livestock management on public lands and must ensure that activities associated with livestock management do not adversely impact the species or its habitat.

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

An inventory of all suitable habitat for I. aprica is needed to identify those populations and habitats necessary to ensure the long-term survival of the species. Surveys are needed on all populations, and should cover age class distribution, documentation of losses, population increase or reduction, and identification of impacts from trampling, grazing, disease, parasitism, etc. on the species. The Bureau of Land Management, Forest Service, and National Park Service are responsible for conducting these surveys on lands under their jurisdiction to meet the requirements for conservation of listed species and for prevention of impacts under section 7 of the Endangered Species Act. The State of Utah, through the Utah Natural Heritage Inventory, also may assist in these surveys. Technical assistance in implementing these responsibilities is available from the Service.

3. Establish and conduct minimum viable population studies on T. aprica populations.

It is not known if the populations of I. aprica exist at levels that will ensure long-term demographic and genetic viability. Minimum viable population studies are needed to document the 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 human 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. In addition, these studies will be useful in refining the number and size of populations needed for the species recovery as identified in the delisting criteria.

4. Conduct research on the biology and ecology of T. aprica.

Little is known concerning the biological and ecological relationships of T. aprica. No known diseases have been reported in this species. More information on the biological and life history characteristics of T. aprica, including potential natural threats such as disease, parasitism, and grazing by native species is needed to adequately manage and protect the species habitat and to ensure the continued survival of the species and the preservation of its ecosystem.

5. Determine the horticultural requirements and establish garden populations of T. aprica.

The introduction and maintenance of T. aprica in recognized botanical gardens will assist in public education of the significance and importance of this species. It also will provide a reserve of seeds and plants for reintroduction should wild populations be lost.

6. Evaluate the need for the introduction of artificial populations into suitable habitat.

The introduction of artificial populations of T. aprica in suitable habitats as a measure to ensure the species continued survival or to facilitate its delisting needs to be evaluated. This introduction should be considered only after completion of thorough surveys for additional T. aprica populations and after completion of biological, ecological, and horticultural research on the species and its populations.

7. Establish formal land management designations that would provide for long-term, undisturbed habitat for T. aprica.

Formal land management designations may be needed on areas where T. aprica occurs and on other suitable habitats that may be determined to be necessary for recovery of the species. These designations will need to be made by the Bureau of Land Management, Forest Service, and National Park Service for properties under their jurisdictions. Designations such as Research Natural Areas, Areas of Critical Environmental Concern, specially designated units of the National Park System, designated wilderness, or private and State natural preserves and parks may be appropriate for T. aprica habitats. Such designations should provide long-term protection for

enough populations of I. aprica to ensure its survival as a vigorous reproducing species into the foreseeable future.

8. Develop public awareness, appreciation, and support for the conservation of I. aprica.

Education is a vital part of the recovery process. The cooperation of the 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 in schools and with groups interested in conservation. The introduction and maintenance of I. aprica in recognized botanical gardens will assist in public education of the significance and importance of this species.

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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 estimated costs. These actions, when accomplished, should bring about the recovery of Townsendia aprica 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 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

BLM - Bureau of Land Management
NPS - National Park Service
CPC - Center for Plant Conservation
FHA - Federal Highway Administration
OSM - Office of Surface Mining Reclamation and Enforcement
FS - Forest Service
UDOG- Utah Division of Oil, Gas, and Mining
UT - State of Utah, including the Utah Natural Heritage Inventory
FWS - Fish and Wildlife Service
ES - Fish and Wildlife Ecological Services
LE - Law Enforcement

Townsendia aprica (Last Chance townsendia) Recovery Implementation Schedule

Priority	Task	Task Description	Task Duration	Responsible Party			Cost Estimates			Comments
				FWS		Other	FY-01	FY-02	FY-03	
				Region	Program					
2	1.1	Control mineral development activities	ongoing	6	ES	BLM, FS, NPS, OSM, UDOG				Part of ongoing agency programs
2	1.2	Control off-road vehicle use and recreational activities	ongoing	6	ES	BLM, FS, NPS, UT				Part of ongoing agency programs
2	1.3	Control road building and maintenance	ongoing	6	ES, LE	BLM, FS, NPS, FHA				Part of ongoing agency programs
2	1.4	Control livestock management activities	ongoing	6	ES	BLM, FS, NPS				Part of ongoing agency programs
2	2	Inventory suitable habitat for I. aprica populations	3 years	6	ES	BLM, FS, NPS, UT	3,000	3,000	3,000	
2	3	Conduct I. aprica MVP studies	10 years	6	ES	BLM, FS, NPS, UT	5,000	5,000	5,000	
2	4	Conduct research on biology and ecology of I. aprica	5 years	6	ES	BLM, FS, NPS, UT	5,000	5,000	5,000	
2	5	Determine horticultural requirements and establish a garden population of I. aprica	ongoing	6	ES	UT	3,000	1,000	1,000	
3	6	Evaluate need for establishment of artificial populations	1 year	6	ES	BLM, FS, NPS	--	--	--	
3	7	Establish formal land management designations	unknown	6	ES	BLM, FS, NPS				Part of ongoing agency programs
3	8	Develop public education program for the conservation of I. aprica	2 years	6	ES	BLM, FS, NPS	5,000	5,000	—	

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. 14732) on April 22, 1992 and closed on June 22, 1992. Approximately 80 press releases were sent to the print media located in Utah.

During the public comment period five 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.