

SPECIES MANAGEMENT GUIDE FOR

Lomatium rollinsii

1988

Bob Moseley
Natural Heritage Section
Nongame Wildlife/Endangered Species Program
Idaho Department of Fish and Game
600 South Walnut, P.O. Box 25
Boise, Idaho 83707

Cooperative Challenge Cost Share Project
Wallowa-Whitman National Forest
Idaho Field Office, The Nature Conservancy

Purchase Order No. 43-04M3-8-5148

TABLE OF CONTENTS

Introduction	1
Biological Information	3
Plant Description	3
Range and Distribution	5
Habitat Description	5
Population Biology	6
Reproduction	6
Threats	7
Management Plan	8
Management of <u>Lomatium rollinsii</u>	8
Monitoring	8
Implementation and Review	8
References	9
Appendices:	
Appendix 1. Illustration of <u>Lomatium rollinsii</u> .	
Appendix 2. Range of <u>Lomatium rollinsii</u> .	
Appendix 3. Maps of <u>Lomatium rollinsii</u> populations surveyed in 1988.	
Appendix 4. Data base printouts of recent, unverified occurrences of <u>Lomatium rollinsii</u> in Washington and Idaho.	
Appendix 5. Ownership and occurrence quality information for known populations of <u>Lomatium rollinsii</u> .	
Appendix 6. Plot data and slides.	

INTRODUCTION

The National Forest Management Act and Forest Service policy require that Forest Service land be managed to maintain populations of all existing native animal and plant species at or above the minimum viable population level. A minimum viable population consists of the number of individuals, adequately distributed throughout their range, necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations.

The Forest Service, along with other Federal and State agencies, has recognized the need for special planning considerations in order to protect the flora and fauna on the lands in public ownership. Species recognized by the Forest Service as needing such considerations are those that (1) are designated under the Endangered Species Act as endangered or threatened, (2) are under consideration for such designation, or (3) appear on a regional Forest Service sensitive species list.

Lomatium rollinsii is currently on the U.S. Fish and Wildlife Service notice of review list as a candidate for listing (Category C2) under the Endangered Species Act (U.S. Fish and Wildlife Service 1985). It is also on the USFS Region 6 Sensitive Plant Species List, USFS Region 1 Sensitive Species List, and Idaho BLM Sensitive Species List. It is considered Threatened in Washington (Washington Natural Heritage Program 1987), Threatened in Oregon (Oregon Natural Heritage Data Base 1987), and Sensitive (Priority 3) in Idaho (Idaho Natural Heritage Program 1988).

The species was first collected by Lincoln Constance and Reed Rollins, "near Deep Creek, Snake River Canyon," Wallowa County, Oregon, on 15 May 1936. L. rollinsii was formally described in 1943 (Mathias and Constance 1943). Because few specimens of L. rollinsii were collected over the next 40 years, it was considered an extremely rare taxon endemic to the Snake River and lower Salmon River canyons of northeast Oregon, southeast Washington and adjacent Idaho. Also, collection data suggested that it was restricted to the river corridors in these canyons. Due to its rarity, threats to L. rollinsii were unknown, but overgrazing by domestic livestock was considered a possibility (Brunsfield 1983; Meinke 1983) and attempts to relocate several populations cited in the original description were unsuccessful (Schlessman 1984).

Field work conducted in late April and early May 1988, in Oregon and Idaho revealed L. rollinsii to be quite common in suitable habitats, from river level, as low as 800 feet, up the canyon side to about 3800 feet. Several factors appear to be responsible for this dramatic increase in known L. rollinsii populations: (1) It flowers from early April to early May, before many academic botanists are in the field collecting, (2) Fruits mature quickly and shatter by mid-May at the lower elevations, making identification difficult, (3) Canyons in this region have a high diversity of Lomatium taxa, again making identification difficult, and (4) Much of its distribution occurs in remote canyons and/or relatively inaccessible habitats.

The primary objective of this Management Guide is to outline a plan for managing L. rollinsii on the Wallow-Whitman National Forest, including the Nez Perce National Forest portion of the

Hells Canyon National Recreation Area administered by the Wallowa-Whitman. Because of its wide distribution and lack of apparent threats, no special management is recommended for L. rollinsii. A recommendation will be made to the U.S. Fish and Wildlife Service for a status change in candidate categories from Category 2 to Category 3c.

This guide is divided into two major sections. The first provides the most recent information on the range, distribution, population, biology, and habitat requirements of L. rollinsii. The second section defines the management plan for the species.

BIOLOGICAL INFORMATION

Plant Description

Lomatium rollinsii Mathias and Constance is a member of the Apiaceae (Umbelliferae) or celery family. The genus consists of 70 species, distributed throughout western North America, occurring in arid and semi-arid regions where they flower in late winter and early spring, and complete their reproductive cycle before the onset of summer drought. Lomatium rollinsii belongs to an infrageneric group known as tuberous lomatiums (Schlessman 1980). This group is most common and diverse in the steppe and sagebrush-steppe region of the Columbia River Plateau in eastern Washington and Oregon and adjacent Idaho, where they form a conspicuous element of the early spring flora.

The following technical description of L. rollinsii is from Schlessman (1984):

Plants caulescent, 20-70 cm tall at maturity. Roots with a single ovoid thickening, 1-3 cm long and 0.5-1 cm in diameter, or monoliform, the surface brown. Leaves bipinnately compound and pinnately-ternately dissected; petioles partially to wholly sheathing, green; blades oblong in general outline, 2.5-12 cm long, scaberulous; ultimate leaf segments 15-40, linear, 0.5-1.5 cm long, 0.5-2 mm wide, the apices rounded to acute. Umbels 2-several, scaberulous; rays 4-10, the outer ones 3-7 cm long at maturity; involucels present, the bractlets 2-5, free, filiform, 2-3 mm long, less than 0.5 mm wide, the apices acute. Flowers 15-20 per umbellet; petals, anthers, and stylopodia yellow, the stylopodia smooth; ovaries glabrous. Fruiting pedicels 5-11(-15) mm long at maturity. Mericarps ligulate in cross section, ovate in outline, 5-8 mm long, 3-4.5 mm wide, glabrous; lateral wings of the mericarps slightly less than one-half as wide as the body, 0.7-1 mm wide, the cell wall thin; oil canals 1-2 in the intervals, 4-6 on the commissure.

Illustrations of L. rollinsii can be found in Hitchcock et al. (1961) and Meinke (1983).

Illustrations from the latter have been reproduced in Appendix 1.

One reason L. rollinsii has probably been overlooked for many years is the identification problems associated with the large number of Lomatium taxa occurring in the canyons of the region. Ten species were encountered during the course the field work in April and May 1988. Only three of these ten species fall into the tuberous lomatium group, however. One additional tuberous species also occurs in the area (Schlessman 1984), but was not observed. Tuberous lomatiums are characterized by roots with tuberous thickenings, leaves with narrow segments, and fruits with an elliptical outline and narrow, thin lateral wings (Schlessman 1984). See Table 1 for keys to tuberous lomatiums of the lower Salmon River and Snake River canyons of northeastern Oregon, southeastern Washington, and adjacent Idaho.

=====

Table 1. Keys to tuberous lomatiums of the lower Salmon and Snake river canyons (from Schlessman 1984).

Key Emphasizing Floral and Vegetative Characters

1. Involucels absent; plants glabrous.

L. ambiguum

1. Involucels present; plants glabrous to scaberulous (beset with minute, cuticular barbs no more than 0.3 mm long).

2. Involucellar bractlets narrowly to broadly obovate, 0.8-3.2 mm wide; stylopodia with cavities in the upper surface, these 0.10 mm wide, visible with 10x hand lens.

L. cous

2. Involucellar bractlets linear to elliptic, 0.1-1.6 mm wide; stylopodia smooth.

3. Plants caulescent, scaberulous; leaves bipinnately compound.

L. rollinsii

3. Plants acaulescent or rarely caulescent with one or two cauline leaves, glabrous to scaberulous; leaves ternately, ternately-pinnate, or quinately compound.

L. bicolor var. leptocarpum

Key Emphasizing Features of the Mericarp (Fruit)

1. Longest fruiting pedicels 6 mm long or longer.

2. Plants glabrous; involucels absent, mericarps elliptic, 5-12 mm long, 1.3-3.3 mm wide.

L. ambiguum

2. Plants scaberulous (beset with minute cuticular barbs no more than 0.3 mm long); involucels present, mericarps ovate, 5-8 mm long, 3.4-5 mm wide.

L. rollinsii

1. Longest fruiting pedicels up to 5 mm long.

3. Mericarps granular-roughened with more than 5 papillae per square mm.

L. cous

3. Mericarps glabrous or granular roughened with less than 5 papillae per square mm.

4. Mericarps linear, 9-17 mm long, 1.5-3 mm wide; rays and often peduncles and leaves scaberulous. **L. bicolor var. leptocarpum**

4. Mericarps elliptic to ovate, 4-13 mm long, 2.4-6.5 mm wide; rays, peduncles, and leaves glabrous. **L. cous**

=====

Range and Distribution

Lomatium rollinsii is found in the deep canyons of the Snake River and lower Salmon River in northeastern Oregon, southeastern Washington and adjacent Idaho (Appendix 2). More specifically, it appears to be distributed from the Lewiston-Clarkston area, at the confluence of the Snake and Clearwater rivers, up the Snake River to about Big Bar in Hells Canyon; in the

Salmon River canyon from its confluence with the Snake River to about Lake Creek, 7 miles east of Riggins; and up the Little Salmon River to Pollock. Elevationally, L. rollinsii occurs from the river level, which varies from about 800 feet near Lewiston to 1800 feet above Riggins, up the canyonsides to about 3800 feet.

Within the general range outlined above, L. rollinsii populations are distributed in a more-or-less continuous manner in suitable habitats. Gaps in the distribution, however, were found. The most conspicuous was along a section of the Snake River canyon below the confluence of the Salmon River, where no populations were found in what appeared to be ideal habitat.

Maps of 35 occurrences surveyed in 1988 appear in Appendix 3. These maps constitute the entire known range of L. rollinsii in Oregon and most of its known range in Idaho. Location records for eight Washington populations, obtained from the Washington Natural Heritage Program data base appear in Appendix 4. One recent sighting of L. rollinsii in Idaho, unverified in 1988, also appears in Appendix 4. Appendix 5 lists ownership and quality for each known occurrence of Lomatium rollinsii.

Habitat Description

Lomatium rollinsii is found in mid- to low elevation canyon grasslands, ranging from very steep to relatively gentle slopes and dominated by one to four bunchgrasses. Populations occur in several grassland and shrubland associations, ranging from late to very early seral stages of succession. Lomatium rollinsii has been observed in the following associations/communities (Johnson and Simon 1987):

- very early Agsp-Spcr-Arlo3 (dominated by Aristida longiseta)
- early Agsp-Spcr-Arlo3
- Feid-Kocr (low)
- Feid-Agsp/Phco2
- Agsp-Poa
- Spcr
- Glne/Agsp
- Rhgl/Agsp

Population Biology

No population studies have been conducted on Lomatium rollinsii, therefore, almost nothing is known of population demography. Forty-four populations have been observed since 1980 and another six historical collections, dating back to 1936, are documented. No population has been consistently studied or observed over time, but efforts to relocate L. rollinsii at several early collection sites have been unsuccessful. Its disappearance at these sites, however, is due to

severe habitat alteration rather than any inherent problems in the species biology.

Many life history and morphological characteristics of tuberous *Lomatium*s, outlined by Schlessman (1984), represent adaptations to an early, short, windy growing season followed by a long summer drought. The low habit keeps the plant in a relatively warm layer near the ground and makes the plant less subject to damage from wind. Small size allows rapid completion of the reproductive cycle. Leaves with narrow segments, rather than broad leaflets, are adapted for maintenance of photosynthetic activity in arid environments. Winged fruits may facilitate wind dispersal, and tuberous roots store photosynthates over the summer for rapid utilization the following spring. The pollination mechanism allows both outcrossing and selfing, which assures some seed production even in adverse conditions.

Lomatium rollinsii occurs in a wide range of seres, from very early to late seral, in several plant associations. The successional stage did not appear to affect population numbers or density. Although the numbers of individuals varied widely from population to population, all but the smallest (e.g., Royal Gorge and McKinzie Creek) appeared viable, containing a range of age classes.

Reproduction

Lomatium rollinsii is a nonrhizomatous, polycarpic perennial species, that is, it reproduces more than once in a multiyear life span. No detailed reproductive studies have been conducted on *L. rollinsii*, however, Schlessman (1982) studied the floral biology of other species of tuberous *Lomatium*s.

As mentioned in the previous section, the pollination mechanism in *L. rollinsii* allows both outcrossing and selfing (Schlessman 1984). This allows seed production in isolated populations regardless of whether or not they are cross-pollinated. It appears then, that even the smallest populations may be considered viable if they are left undisturbed by human-caused disturbances.

Threats

Natural Threats -- No natural disturbances appear to threaten *Lomatium rollinsii* populations. Native ungulate grazing, insect herbivory, and wildfires do not pose serious threats. Natural succession also does not appear to be a threat.

Human-caused Threats -- Several of the historical collections from the 1930's and 1940's were not relocated during the course of our 1988 field work and Schlessman's (1984) studies in the late 1970's and early 1980's. All these collections were from areas that are now highly altered, largely by cultivation or heavy livestock grazing which has left little native vegetation intact. Total alteration of the native community appears to be the largest single threat to *Lomatium rollinsii*.

Vigorous populations of Lomatium rollinsii occur in stands ranging from late to very early seral. Without exception, early seral conditions in these stands was created by past livestock grazing. In general, the ecological condition of grassland and shrubland communities containing L. rollinsii in the Salmon River Canyon are much lower than in the Snake. Many were dominated by Aristida longiseta, which appears to be an early seral stage of the Agropyron spicatum-Sporobolus cryptandrus-Aristida longiseta community type (Johnson and Simon 1987). It should be noted, however, that even though L. rollinsii populations occurred in early seral stands, current livestock grazing levels on all high quality sites is low.

MANAGEMENT PLAN

Management of *Lomatium rollinsii*

L. rollinsii is one of a relatively large number of taxa endemic to, although quite common in the Hells Canyon region. In fact, it appears to be more common than several other of the Hells Canyon endemics that were never seriously considered for special protection (e.g., *Lomatium serpentinum* and *Ribes cereum* var. *colubrinum*).

There appears to be little special attention required in the management of *Lomatium rollinsii* by land-managing agencies. The species is widespread in the canyons of west-central Idaho and adjacent Oregon and Washington in a variety of communities from late to very early seral stages. Forty-four populations have been observed in the tri-state area since 1980. Many more populations undoubtedly occur throughout the relatively inaccessible canyon country of this region. Cultivation and heavy cattle grazing appear to be the greatest threats to the species, but the inaccessibility of some *L. rollinsii* habitat will isolate much of it from these types of disturbance. It should be noted that no *L. rollinsii* was found on sites that are currently heavily grazed. If grazing in Hells Canyon NRA is increased much above present levels, the status of *L. rollinsii* should be reevaluated.

Because of its abundance and insulation from disturbance, I recommend that *Lomatium rollinsii* be dropped from the Region 6 and Region 1 Sensitive Species list, Idaho BLM Sensitive Species list, and the U.S. Fish and Wildlife Service Candidate Notice of Review for the Endangered Species Act. A Global Heritage rank of G3 is recommended because it is common within a restricted range. Individual Heritage Program data bases will have to make the decision as to its status/rank within their states.

Monitoring

This species requires no special monitoring. Three plots were established during the field survey of 1988. Plot data cards are included in Appendix 6.

Implementation and Review

The recommendations in this plan require approval by the U.S. Fish and Wildlife Service, since current Region 6 sensitive species regulations state that all Category 1 and 2 Candidate species are to be automatically included on the Regional Forester's sensitive species list. A recommendation will be made to the Fish and Wildlife Service to downgrade *Lomatium rollinsii* to a Category 3c Candidate. On publication of a C3 status for this species in the Federal Register, it can be dropped from the Regional Forester's and the Wallowa-Whitman National Forest Sensitive Species list.

REFERENCES

- Brunsfeld, S.J. 1983. Lomatium rollinsii. Page 27 In: Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, compilers, Vascular Plant Species of Concern in Idaho. Bull. Number 34. Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow, ID.
- Hitchcock, C.L., A. Cronquist, M. Ownbey, J.W. Thompson. 1961. Vascular plants of the Pacific Northwest, Part 3. University of Washington Press, Seattle. 614 p.
- Idaho Natural Heritage Program. 1988. Conservation status of rare vascular plants in Idaho. Department of Fish and Game, Boise, ID.
- Johnson, C.G., and S.A. Simon. 1987. Plant associations of the Wallowa-Snake Province, Wallowa-Whitman National Forest. R6-ECOL-TP-255A-86. USDA, Forest Service, Pacific Northwest Region, Wallowa-Whitman National Forest, Baker, OR. 400 p, plus appendices.
- Mathias, M., and L. Constance. 1943. New Umbelliferae - II. Bulletin of the Torrey Botanical Club 70:59-60.
- Meinke, R.J. 1983. Threatened and endangered vascular plants of Oregon: An illustrated guide. U.S. Fish and wildlife Service, Region 1, Portland, OR. 352 p.
- Oregon Natural Heritage Data Base. 1987. Rare, Threatened and Endangered Plants and Animals of Oregon. The Nature Conservancy, Portland, OR. 39 pp.
- Schlessman, M.A. 1980. Systematics of tuberous species of Lomatium (Umbelliferae). Ph.D. Dissertation, University of Washington.
- Schlessman, M.A. 1982. Expression of andromonoecy and pollination of tuberous lomatiums (Umbelliferae). Systematic Botany 7:134-149.
- Schlessman, M.A. 1984. Systematics of tuberous lomatiums (Umbelliferae). Systematic Botany Monographs 4:1-55
- U.S. Fish and Wildlife Service. 1985. Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species; notice of review. Federal Register 50(188): 39526-39585 (27 September 1985)
- Washington Natural Heritage Program. 1987. Endangered, Threatened and Sensitive Vascular Plants of Washington. Department of Natural resources, Olympia, WA. 33 p.

APPENDIX 1

Illustration of Lomatium rollinsii (from Meinke 1983).

APPENDIX 2

Range of Lomatium rollinsii.

APPENDIX 3

Maps of Lomatium rollinsii populations surveyed in 1988.

IDAHO

- Map 1. Portion of Grave Point 7.5' quad.
- Map 2. Portion of Grave Point 7.5' quad.
- Map 3. Portion of Grave Point 7.5' quad.
- Map 4. Portions of Kirkwood Creek 7.5' and Kernan Point 15' quads.
- Map 5. Portion of Pollock 7.5' quad.
- Map 6. Portion of Riggins 7.5' quad.
- Map 7. Portion of Riggins Hot Springs 7.5' quad.
- Map 8. Portion of Lucile 7.5' quad.
- Map 9. Portion of Lucile 7.5' quad.
- Map 10. Portion of Slate Creek 7.5' quad.
- Map 11. Portion of Slate Creek 7.5' quad.
- Map 12. Portion of Whitebird 7.5' quad.
- Map 13. Portion of Fenn 7.5' quad.

OREGON

- Map 1. Portion of Deadhorse Ridge 7.5' quad.
- Map 2. Portion of Cactus Mountain 7.5' quad.
- Map 3. Portion of Kernan Point 15' quad.
- Map 4. Portions of Kernan Point 15', Kurry Creek & Kirkwood Creek 7.5' quads.

APPENDIX 4

Data base printouts of recent (1970-1988), unverified occurrences of Lomatium rollinsii in Washington and Idaho.

APPENDIX 5
 Ownership and occurrence quality of known populations of
Lomatium rollinsii.

Population	Location	Ownership ¹	Quality ²
<u>IDAHO</u>			
Bobcat Bar	Snake	F&G	C?
West Creek #1	Snake	NRA	C
West Creek #2	Snake	NRA	C
Wild Horse Ridge #1	Snake	NRA	B
Wild Horse Ridge #2	Snake	NRA	B
Kurry Creek	Snake	NRA	B
Royal Gorge	Snake	NRA	D
Kirkwood Ridge	Snake	NRA	A
Pollock Road	Little Salmon	private	B
Cat Creek	Salmon	private	C
Riggins Cemetery	Salmon	private	A
Race Creek	Salmon	private	B
Time Zone	Salmon	BLM	A
Lucile Caves	Salmon	BLM	B
Milepost 206	Salmon	private	C
Long Gulch	Salmon	BLM	B
Blackhawk Bar	Salmon	BLM	B
Nut Basin Road	Salmon	private	C
Sportsmen's Access	Salmon	BLM	A
McKinzie Creek	Salmon	BLM	D
Russell Bar	Salmon	BLM	A
Skookumchuck Creek	Salmon	BLM	AB
Salmon Bridge	Salmon	BLM	A
Salmon Face	Salmon	BLM	A
Hammer Creek	Salmon	private	C
Pine Bar	Salmon	BLM	B
<u>OREGON</u>			
Eureka Creek	Snake	NRA	B
Fence Creek	Snake	NRA	A
Robinson Gulch	Snake	NRA	A
Trail Gulch	Snake	NRA	A
Lonepine Creek	Snake	NRA	A
Lookout Creek	Snake	NRA	A
Tryon Creek	Snake	NRA	A
Pleasant Valley Ridge	Snake	NRA	A
Backpasture Gulch	Snake	NRA	A
Robertson Ridge	Snake	NRA	A

¹Ownership: NRA = Hells Canyon National Recreation Area

BLM = Idaho Bureau of Land Management, Coeur d'Alene District
F&G = State of Idaho, Department of Fish and Game

²Quality: The quality of a population/occurrence is ranked A through D based on representativeness, habitat condition, population viability, and defensibility.
A = highest quality; D = Lowest.

Population	Location	Ownership ¹	Quality ²
------------	----------	------------------------	----------------------

WASHINGTON

004	Snake	private	CD?
005	Grande Ronde	private?	BC?
006	Snake	private	C?
007	Snake	?	BC?
008	Snake	BLM/private	BC?
009	Snake	private	?
010	Grande Ronde	private	BC?
011	Snake	private	?

¹Ownership: NRA = Hells Canyon National Recreation Area
BLM = Oregon/Washington Bureau of Land Management, Spokane District

²Quality: The quality of a population/occurrence is ranked A through D based on representativeness, habitat condition, population viability, and defensibility.
A = highest quality; D = Lowest.

APPENDIX 6

Plot data and slides.