

5-Year Review

Short Form Summary

Species Reviewed: *Lomatium cookii* (Cook's desert parsley, Cook's lomatium)

Current Classification: Endangered

Federal Register Notice citation announcing initiation of this review:

U.S. Fish and Wildlife Service. September 2, 2010. Endangered and Threatened Wildlife and Plants; Initiation of 5-year Status Reviews for *Lomatium cookii* (Cook's lomatium) and *Limnanthes floccosa* ssp. *grandiflora* (Large-flowered woolly meadowfoam). Federal Register 75:53978-53979.

Lead Region/ Field Office U.S. Fish and Wildlife Service Region 1 (Sarah Hall), (503) 231-6868/Oregon Fish and Wildlife Office, Roseburg Field Office (Jim Thraikill, primary contact), (541) 957-3470.

Name of Reviewers:

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Methodology used to complete the review:

The review was completed by the U.S. Fish and Wildlife Service (Service) and is based on the final critical habitat designation for *Limnanthes floccosa* ssp. *grandiflora* and *Lomatium cookii* published in the Federal Register on July 21, 2010 (75 FR 42490). The primary sources of information used in this analysis were recent Roseburg Field Office staff survey information and the 2006 Draft Recovery Plan for Listed Species of the Rogue Valley Vernal Pool and Illinois Valley Wet Meadow Ecosystems (Draft Recovery Plan) (USFWS 2006). The findings of this review are also informed by Oregon Department of Agriculture (ODA), Institute for Applied Ecology (IAE), Bureau of Land Management (BLM), and The Nature Conservancy (TNC) research and monitoring reports that have been conducted since *Lomatium cookii* was listed in 2002 (67 FR 68004).

Background:

Lomatium cookii was listed as endangered on November 7, 2002 (USFWS 2002). Critical habitat designation was deferred at the time due to higher critical habitat listing priorities. The Draft Recovery Plan was published on June 30, 2006. On December 19, 2007, the Center for Biological Diversity filed a complaint against the Service for failure to designate critical habitat for four plant species, including *Limnanthes floccosa* ssp. *grandiflora* and *Lomatium cookii*. In a settlement agreement reached on April 11, 2008, the Service agreed to submit a proposed rule for critical habitat for both plants to the *Federal Register* by July 15, 2009 and a final rule by July 15, 2010. The final rule designating 6,289 acres of critical habitat for *Lomatium cookii* was published in the *Federal Register* on July 21, 2010 (75 FR 42490). For additional information regarding the species listing history, biology, habitat, status, threats, management efforts, and other facts, please refer to the Fish and Wildlife Service's Environmental Conservation On-line System (ECOS) database for threatened and endangered species

(http://ecos.fws.gov/tess_public) and the final critical habitat designation for *Lomatium cookii* published in the Federal Register on July 21, 2010 (USFWS 2010).

Application of the 1996 Distinct Population Segment (DPS) Policy:

This Policy does not apply to plants.

Review Analysis:

No new threats and no significant new information regarding the species' biological status are known to warrant a change in the Federal listing status of *Lomatium cookii*.

Lomatium cookii occurs in Jackson County, within the Rogue River Valley, near the towns of Medford, White City, and Eagle Point. It also occurs in Josephine County, within the Illinois River Valley, near the towns of Selma, Cave Junction, and O'Brien (USFWS 2010). In the Rogue River Valley, *Lomatium cookii* is associated with relatively undisturbed vernal pool–mounded prairie habitat in the Agate Desert area. In the Illinois Valley, plants are associated with wet meadows, sloped upland forest openings, and shrubby habitats (ONHP 1997; USFWS 2002; USFWS 2010).

Lomatium cookii is generally found in areas that still have relatively intact habitat components, although small remnant populations are often found adjacent to mining, agricultural development, residential or commercial development, and grazing activities (ONHIC 2008).

Lomatium cookii populations are often enhanced when managed specifically for conservation or managed using compatible agricultural practices, as in the case of a private livestock owner who has conducted controlled grazing for many years and has an especially dense population of *L. cookii* on his property (Borgias 2004). The Rogue Valley International–Medford Airport is an example of an area that is mowed regularly to meet Federal Aviation Authority safety requirements and supports a large and prolific *L. cookii* population that extends over seven acres (R. Russell, pers. comm. 2004; USFWS 2009).

Sites occupied by *Lomatium cookii* that receive no management continue to support plant occurrences, but monitoring suggests that some of those are declining (Borgias 2004, Kaye and Thorpe 2008). For example, Borgias (2004) observed that, after several years without grazing or fire at The Nature Conservancy's Agate Desert Preserve, thatch accumulated and recruitment of young *Lomatium cookii* declined due to the increases of nonnative annual grasses. In the Illinois River Valley, reports indicate that vegetative succession, herbivory by voles (*Microtus* spp.), or both, may be the cause of population declines (Kaye and Thorpe 2008).

Currently 13 and 38 occurrences of *Lomatium cookii* are known in the Rogue River Valley and the Illinois River Valley, respectively. There are 2,500 acres of critical habitat designated in Jackson County and 4,500 acres in Josephine County.

Threats:

Factor A listing threats include habitat or population loss due to development, either through present or threatened destruction, modification or curtailment of habitat or range (USFWS 2002). Factor A threats to *Lomatium cookii* in the Rogue and Illinois River valleys include habitat impacts resulting from residential, urban, and commercial development; aggregate and mineral mining; agricultural development (including leveling, ditching, tilling, and stock pond construction or water impoundments); road construction and maintenance; off-road vehicle (ORV) use that affects surface hydrology; incompatible grazing practices; and encroachment by nonnative plants (ONHDB 1994; USFWS 2002). The adverse effects of residential, urban, and commercial development are more evident in the Rogue River Valley while the threat of mining is a more conspicuous threat in the Illinois River Valley (USFWS 2002; USFWS 2010).

Factor A impacts resulting from residential, urban, agricultural, industrial, and commercial development between 1940 to present, resulted in over 60 percent loss of the vernal pool landscape in the Rogue River Valley due to removal of habitat, altered hydrology, or altered topography (ONHP 1997; Wille and Petersen 2006).

Vandalism are Factor A threats in the form of intentional disregard or dismantling of signage or fencing intended to protect certain wetland areas from unauthorized ORV use, and subsequent damage resulting from that use, has resulted in negative effects on the hydrology of the habitat for *Lomatium cookii* (for example, by altering the surface hydrology, resulting in excess or a lack of hydrology in otherwise suitable habitat).

The effect of grazing on suitable habitat depends on how the grazing is managed. There are various reports showing how grazing practices can positively or negatively affect native plant species' richness (Marty 2005). Marty's (2005) study indicates that wet season grazing resulted in a decrease of native forb species at vernal pool edge habitat, but year-round grazing actually improved species' richness (Factor A listing threats).

Lomatium cookii is also threatened by encroachment of nonnative plants and small population size (Factor E listing threats). Nonnative plants that can outcompete *L. cookii* include annual grasses and herbs. Nonnative grasses, namely *Hordeum marinum* ssp. *gussoneanum* (Mediterranean barley), *Lolium* spp. (perennial and annual rye), and *Taeniantherum caput-medusae* (medusahead), form a dense thatch layer that inhibits plant growth (USFWS 2010).

Since the time of listing there is a lack of evidence that overutilization (Factor B), disease, or predation (Factor C), are significant threats to the species. Depending on whether intentions were deliberate or inadvertent, Factor D, the lack of legal protection for all federally or state listed plants on privately owned property could be partially responsible for much habitat loss in recent years due to development in areas that were incorrectly assumed to be outside of jurisdictional wetlands (USFWS 2006).

Conservation:

Since the Draft Recovery Plan was published in 2006, progress has been made in

implementing several recommended recovery criteria (Table 1). Medford BLM is restoring *Lomatium cookii* habitat within two Areas of Critical Environmental Concern (ACECs) in the Illinois River Valley by reducing shrub and tree encroachment in the meadow (S. Fritts, pers. comm. 2009). At other habitat on TNC preserves in the Rogue River Valley, planting of native bunchgrass, mowing non-native sweet-briar rose (*Rosa eglantheria*), and performing controlled burns are used to control nonnative annual grasses (D. Borgias pers. comm. 2009). Although plant responses appear to be initially favorable to these management actions on the Agate Desert Preserve, *L. cookii* has remained more or less stable over the last 15 years (Borgias 2004).

Table 1. Status of *Lomatium cookii* from listing to 5-year review

Listing	Recovery core areas with protected habitat	95% of priority 1 and 85% of priority 2 core areas protected	Acres protected	Known occurrences
2002 (listing)	4 partially	No	1,492	36
2006 (Draft Recovery Plan)	4 partially	No	1,662	37
2010 (critical habitat/5- year review)	5 partially	No	1,787	37

Attempts of *Lomatium cookii* establishment utilizing both seed and greenhouse starts are underway at Medford BLM lands and TNC preserves, but it is too soon to see any positive results. Seeding and plug planting of *Lomatium cookii* at the TNC’s Agate Desert Preserve in the Rogue Valley, and BLM lands at the French Flat ACEC and Reeve’s Creek watershed have found varied success of plant establishment. Both seeding and plug planting at the Agate Desert site have failed to establish large proportions of plants after three years; seedling establishment was only 6 percent and plug establishment was 7 percent after three years (Kaye et al. 2010). At French Flat, plugs and direct seeding have been more successful. Three-year seedling establishment was about 12 percent while plug establishment was 46 percent (Kaye et al. 2010). Therefore, reintroduction or augmentation of populations may be possible through planting, but should be expected to differ widely among sites. Efforts to evaluate factors that affect establishment of *Lomatium cookii* are underway.

Recovery

The Draft Recovery Plan for the species (USFWS 2006) recommends the following reclassification criteria for *Lomatium cookii* :

1. At least 95 percent of suitable vernal pool habitat acreage existing (as of 2005) within each (a total of 11) *Lomatium cookii* Priority 1 core area is protected from development and covered under a management plan. Also, at least 85 percent of suitable vernal pool habitat acreage within the single Priority 2 core area is

protected.

2. Management plans in each area are approved and being implemented effectively.
3. Population trends must be shown to be stable or increasing for a minimum of 10 consecutive years.

Since the Draft Recovery Plan was completed in 2006, progress has been made in several draft recovery criteria. Approximately 125 acres of *Lomatium cookii* habitat within four recovery core areas have become protected. This brings the total protected area from 1,662 to 1,787 acres within the range of the species (Table 1). Management has been implemented to benefit the species at a newly secured habitat at the Oregon Department of Transportation's new Vernal Pool Conservation/Mitigation Bank.

In addition, 4,678 *Lomatium cookii* seed is in storage at the Rae Selling Berry Botanic Garden. The Oregon Fish and Wildlife Office has also developed a *Lomatium cookii* 5-year action plan to help prioritize recovery actions and meet strategic goals (Appendix A).

Recommendations for Future Actions:

- Finalize the Draft Recovery Plan
- Develop conservation easements or other protections on existing populations on private lands
- Assist Medford BLM with *Lomatium cookii* habitat restoration and protection in the Illinois Valley
- Assist the Denman Wildlife Area with *Lomatium cookii* habitat restoration and monitoring
- Assist Jackson County Parks with *Lomatium cookii* habitat protection monitoring, and restoration
- Assist TNC with *Lomatium cookii* habitat restoration
- Survey geographical and historical ranges for new *Lomatium cookii* occurrences
- Collect seed from each population
- Establish a genetically managed seed increase program to support outplantings in appropriate core areas
- Identify new protected suitable habitat locations to reintroduce or augment

- Refine outplanting techniques
- Research mowing and grazing management on suitable habitat
- Research rodent exclosure management on suitable habitat
- Initiate climate change response planning, including conducting a Climate Change Vulnerability Index Analysis and identifying potential introduction sites north of the species' current geographic range in Douglas County, Oregon.

References:

- Borgias, D. 2004. Effects of Livestock Grazing and the Development of Grazing Best Management Practices for the Vernal Pool-Mounded Prairies of the Agate Desert, Jackson County, Oregon. Report prepared for the U.S. Fish and Wildlife Service. Portland, Oregon.
- Kaye, T. N. and A. Thorpe. 2008. *Lomatium cookii* population monitoring in the Illinois Valley, Josephine County, Oregon. Report for Medford District Bureau of Land Management. 35 pages.
- Kaye, T.N., I.A. Pfingsten, R.T. Massatti, A.S. Thorpe, I.S. Silvernail, and B. Meinke. 2010. Developing reintroduction techniques for *Lomatium cookii*. Institute for Applied Ecology, Corvallis, Oregon and USDI Bureau of Land Management, Medford District.
- Marty, J. 2005. Effects of cattle grazing on diversity in ephemeral wetlands. *Conservation Biology* 19:1626-1632.
- Oregon Natural Heritage Program (ONHP). 1997. Agate Desert Vernal Pool Habitat: Preliminary mapping and assessment. Report prepared for the Oregon Department of State Lands under Contract No. 10738-369. 23 pages.
- Oregon Natural Heritage Data Base (ONHDB). 1994. Habitat Management Plan for *Lomatium cookii* (Cook's desert-parsley) in the Illinois Valley, Josephine County, OR. Report prepared for the Medford District Bureau of Land Management. 23 pages.
- USFWS (U.S. Fish and Wildlife Service). 2002. Endangered and threatened wildlife and plants: Endangered status for the plants *Lomatium cookii* (Cook's lomatium) and *Limnanthes floccosa* spp. *grandiflora* (large-flowered woolly meadowfoam) in Oregon. Federal Register 67: 68004-68015. November 9, 2002.

USFWS (U.S. Fish and Wildlife Service). 2006. Draft Recovery Plan for Listed Species of the Rogue Valley Vernal Pool and Illinois Valley Wet Meadow Ecosystems. Region 1, Portland, Oregon. xiii + 136 pages.

USFWS (U.S. Fish and Wildlife Service). 2009. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. *grandiflora* (Large-flowered woolly Meadowfoam) and *Lomatium cookii* (Cook's lomatium). Federal Register 74: 37314 -37392. July 28, 2009.

USFWS (U.S. Fish and Wildlife Service). 2010. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Limnanthes floccosa* ssp. *grandiflora* (Large-flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Lomatium). Federal Register 75: 42490 - 42569. July 21, 2010.

Wille, S.A. and R.R. Petersen. 2006. Vernal pool conservation in the Agate Desert, near Medford, Oregon. Verh. Internat. Verein. Limnol. Volume 29, Lahti, Finland.

Personal Communication

Borgias D. 2009. TNC, Medford, Oregon

Fritts. S. 010. Medford BLM, Grants Pass, Oregon (Medford BLM is restoring *Lomatium cookii* habitat within two ACECs in the Illinois River Valley by reducing shrub and tree encroachment in the meadow)

Russell, R. 2005. Rogue Valley International - Medford Airport. 2004

Appendix A. *Lomatium cookii* Action Plan

Responsible office: Roseburg Field Office // Area: Jackson and Josephine counties, Oregon				**benefits both vernal pool fairy shrimp and large-flowered woolly meadowfoam												September 25, 2011						
Priority	Strategic Action	Tasks	State	Priority	Implementing Party	2011			2012			2013			2014			2015				
						Funding request	Funding secured	Funding needed	Funding request	Funding secured	Funding needed	Funding request	Funding secured	Funding needed	Funding request	Funding secured	Funding needed	Funding request	Funding secured	Funding needed		
1	Protect and Manage existing Cook's <i>lomatum</i> populations	Develop easements or establish protection on existing populations on private lands**	OR	1	FWS, land trusts, private	80 Bio Hrs	\$0	80 Bio Hrs			\$0	80 Bio Hrs/ or \$10,000		\$0	80 Bio Hrs	80 Bio Hrs/ or \$10,000	\$0	80 Bio Hrs	80 Bio Hrs	\$0	80 Bio Hrs	
		Assist the Denman Wildlife Area with desert parsley habitat restoration	OR	4	FWS, ODFW	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000					\$5,000	\$0	\$5,000	
		Assist the Medford BLM with desert parsley habitat restoration	OR	3	FWS*, ODFW, TNC		\$0							\$0	\$5,000					\$5,000	\$0	\$5,000
		Assist Jackson County Parks with desert parsley habitat protection and restoration	OR	6	FWS, COUNTY	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000	80 Bio Hrs	\$0	\$0	\$5,000	\$0	\$5,000		
		Assist TNC with desert parsley habitat restoration	OR	7	FWS, ODA, TNC, ODFW	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000					\$5,000	\$0	\$5,000	
		Collect seed from each population targeting private lands	OR	4	FWS*, OPRD	\$3,000	\$0	\$3,000						\$3,000		\$0	\$3,000					
2	Propagate plants to reintroduce and augment existing populations to enhance viability	Refine outplanting techniques	OR	6	FWS, ODA, ODOT	\$4,000	\$0	\$4,000			\$6,000		\$0	\$5,000		\$0	\$3,000					
		Identify new protected locations to reintroduce or augment	OR	7	FWS, ODA, ODOT, TNC	\$10,000	\$0	\$10,000		\$0	\$10,000		\$0	\$10,000				\$10,000	\$0	\$10,000		
		Augment desert parsley at protected suitable habitat in Jackson County	OR	9	FWS, ODA, County	\$10,000	\$0	\$10,000		\$0	\$10,000		\$0	\$0				\$10,000	\$0	\$10,000		
		Augment desert parsley at protected suitable habitat in Josephine County	OR	10	FWS*, ODA, BLM*	\$10,000	\$0	\$10,000	\$10,000	\$0	\$10,000		\$0	\$0				\$10,000	\$0	\$10,000		
3	Conduct research essential to the conservation of the species	Research rodent exclosure management on suitable habitat**	OR	11	FWS, County	\$40,000	\$0	\$40,000	40 Bio Hrs	\$0	40 Bio Hrs											
		Research mowing and grazing management on suitable habitat	OR	12	FWS, ODA, Land trust	\$40,000	\$0	\$40,000	\$40,000	\$0	\$40,000											

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SIGNATURE PAGE for 5-YEAR REVIEW of *Lomatium cookii* (Cook's desert parsley)

Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

- Delisting
- Reclassify from Endangered to Threatened status
- Reclassify from Threatened to Endangered status
- No Change in listing status

Lead Field Supervisor, Fish and Wildlife Service

Paul Benson

Date 9/27/11

Cooperating Field Supervisor, Fish and Wildlife Service

Concur Jim Throckmold

Date 9-27-2011