

5-YEAR REVIEW

Cook's desert parsley (Cook's lomatium) (*Lomatium cookii*)

GENERAL INFORMATION:

Species: *Lomatium cookii*

Date listed: November 7, 2002

FR citation(s): 67 FR 68004 listing; 75 FR 42490 critical habitat designation

Classification: Endangered Species

BACKGROUND:

Most recent status review: September 27, 2011. 5-Year Review for *Lomatium cookii* (Cook's lomatium), U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office. Available at https://ecos.fws.gov/docs/five_year_review/doc3856.pdf and attached here as Appendix B.

FR Notice citation announcing this status review: 82 FR 18665. [Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 138 Species in Hawaii, Oregon, Washington, and California](#). April 20, 2017.

Critical Habitat: 75 FR 42490. [Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Limnanthes floccosa* ssp. *grandiflora* \(Large-Flowered Woolly Meadowfoam\) and *Lomatium cookii* \(Cook's Lomatium\)](#). July 21, 2010.

Recovery Plan: [Recovery Plan for Rogue and Illinois Valley Vernal Pool and Wet Meadow Ecosystems](#). November 6, 2012.

Lomatium cookii is a perennial forb in the carrot family (Apiaceae) found only in southwestern Oregon. *Lomatium cookii* inhabits seasonally wet habitats known as vernal pools in the Agate Desert, just north of the City of Medford in Jackson County's Rogue Valley. Occurrences of the species are also known from an area with a subsurface clay pan and seasonally wet soils in Josephine County (referred to as the French Flat or Illinois Valley sites), immediately west of Jackson County. At the time of listing, there were believed to be about 15 sites of *L. cookii* in the Rogue Valley and 21 sites in the Illinois Valley (U.S. Fish and Wildlife Service 2002, p. 68005).

ASSESSMENT:

Information acquired since the last status review:

This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Roseburg Field Office. We solicited data for this review from interested parties through a Federal Register notice announcing this review on April 20, 2017. More recently, we also contacted private landowners, agencies and organizations conducting recovery efforts for *Lomatium cookii* on their managed lands. These entities include the Medford Water Commission, Rogue Valley International Airport, Medford District Bureau of Land Management (BLM), State agencies [Oregon Department of Transportation (ODOT), Oregon Department of Agriculture Native Plant

Conservation Program (ODA), Oregon Parks and Recreation Department (OPRD), Oregon Department of Fish and Wildlife (ODFW)], and The Nature Conservancy (TNC). Additionally, we conducted a literature search and a review of information in our files. A final recovery plan for the species was adopted by the Service in 2012 (U.S. Fish and Wildlife Service 2012) and has informed this review.

New information:

No significant new data regarding the species' biological status or threats are known to warrant a change in the Federal listing status of *Lomatium cookii* since the previous 5-year review conducted in 2011 (U.S. Fish and Wildlife Service 2011a, entire) (Appendix B). As detailed below, although we have some limited new data available to us in the form of recent population counts and even discovery of a new population, this information does not significantly alter our understanding of the overall abundance and distribution of the species as last evaluated in 2011. At this time, we cannot document an overall improving or declining rangewide population trend of *L. cookii* populations in the Rogue and Illinois Valleys of Jackson and Josephine Counties, Oregon. Similarly, there is no information suggesting either an expanding or contracting distribution of *L. cookii*.

Threats to the species have changed little since the last 5-year review. At the time of listing, the primary threat to *Lomatium cookii* was habitat or population loss due to development, through either present or foreseen destruction, modification or curtailment of its habitat or range (U.S. Fish and Wildlife Service 2002, pp. 68009-68013). As of this current review, development pressures on suitable habitat remain in the Rogue and Illinois Valleys, though the pressures have been slightly alleviated due to the establishment of a mitigation bank and the purchase of lands that provide protection and conservation of the species by land conservancies. Encroachment by woody species, impacts from ORV use, and the indirect effects of mining operations continue as ongoing stressors at several sites, and incompatible grazing practices remain a potential threat. On balance, although we are beginning to make progress on the recovery of the species thanks to the efforts of conservation partners, the status of *L. cookii* has not yet changed significantly since our last assessment completed in 2011.

In sum, 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*.

Abundance. We now know of a total of 36 populations of *Lomatium cookii*, 11 in the Rogue Valley and 25 in the Illinois Valley. Here we present the most recent information available through the individual monitoring programs for most of the 36 sites that have been assessed since the last census. This includes information for one new population record of *Lomatium cookii* (Waldo Road in the Illinois Valley). Information is not available for 15 known occurrences of the species (Table 1). It should be noted that *L. cookii* population parameters fluctuate annually depending on seasonal precipitation and temperature; therefore, it is not unexpected that the species population size estimate will vary from year to year.

Population Updates

Table 1 summarizes the status of all known populations of *Lomatium cookii*. The summaries below present further details for each population with relatively current records available to us.

The single extirpated population formerly occurred on private property (Raven Road population) in the Rogue River Valley, but the habitat no longer supports the plant. “Unknown” populations are populations that have not been observed or visited in over 10 years. Also included in that definition are populations which have been visited but no plants were present after two visits. After three visits over multiple years, with no plants observed, the population is considered extirpated.

Illinois Valley (25 populations; 14* with current records, 11 with unknown status. Figure 1.)

1. The *Lomatium cookii* Middle and South patches of the Logan Cut population, at the BLM’s French Flat Area of Critical Environmental Concern (ACEC), occur within seasonally wet meadows that are adjacent to historic mining operations and tailings piles. These patches have been monitored annually since 1988. The meadows are slowly becoming encroached by conifers and annual grasses. Off-road vehicles (ORVs) have periodically entered the meadows, which has left ruts and displaced soil. The 2017 set of data records indicate that two sample areas within this *L. cookii* population have steadily declined from a high in 1998 of 462,000 plants to a low in 2017 of 80,000 plants, an 82 percent decrease (Pfungsten *et al.* 2017, pp. 15-23). BLM has been performing vegetation management at the site to control succession and the density of annual grasses by removing conifers and performing prescribed burns.
2. BLM’s monitoring of the French Flat Piney Woods population in 2018 documented 2,400 flowering plants, a 242 percent increase from the 700 plants reported in 2010 (BLM 2019). Although the Piney Woods area receives less management than the Middle and South patches, it is also located further away from mine tailings and disturbance from ORV activity, and may allow *L. cookii* to face less competition.
3. In 2018, 50 plants were located at the Esterly Mine population, down from 250 in 2010. Threats to this population are ORV disturbance and forest succession (BLM 2019).
4. In 2010, only 2 plants were located at the Illinois River Woodland population, down from 13 plants observed in 1999 (BLM 2019).
5. The two Reeves Creek North *Lomatium cookii* populations occur in small openings within forested areas. The populations appeared stable and were still extant in 2016, but only receive sporadic monitoring (BLM 2019). A threat to the Reeves Creek North population is ORVs and encroachment from seral succession. BLM has been minimizing ORV use in the area, but has not yet performed vegetation management in the area.
6. No *Lomatium cookii* plants were located at the Woodcock Bog Research Natural Area in 2018. BLM botanists have not located any *L. cookii* within the past 5 years at this site (S. Johnson, pers. comm. 2019). If *L. cookii* plants are not located within or near these patches after two more attempts to locate them, the populations would be considered extirpated.

*Fewer than 14 are listed here due to combining some of the adjacent populations in these descriptions

Table 1. Status of known *Lomatium cookii* populations (USFWS 2012, 2019; BLM 2019). Data dates indicate the most recent population census available.

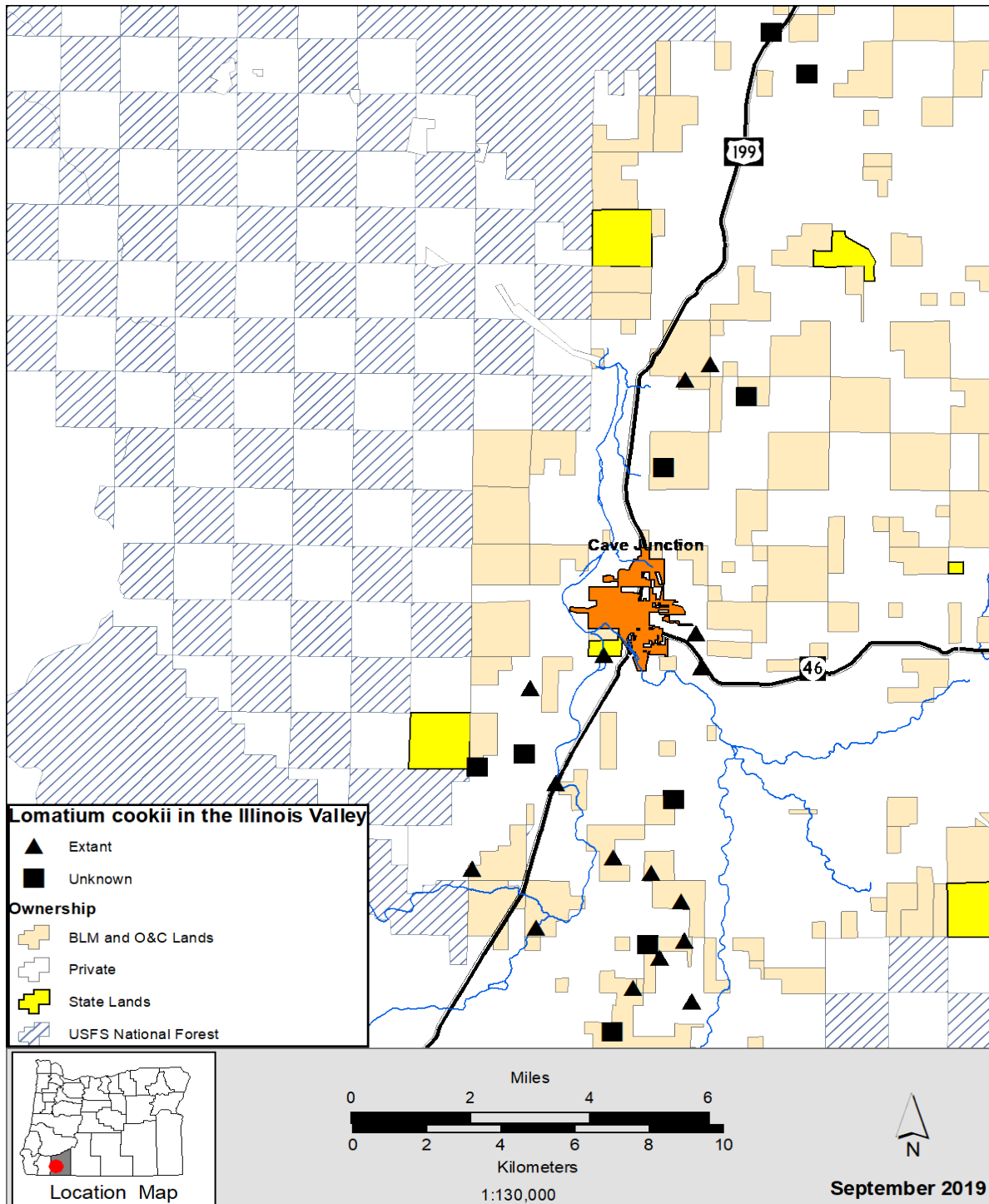
| Illinois Valley Recovery Zone | | | | |
|-------------------------------|---|--------|------------|--------|
| Population | Description | Extant | Extirpated | Status |
| 1 | Anderson Creek (2005 data) | | | U |
| 2 | Draper Creek (2005 data) | | | U |
| 3 | French Flat Carrol Slough (2017 data) | | | U |
| 4 | French Flat Logan Cut (2018 data) | ✓ | | |
| 5 | French Flat Esterly Mine (2018 data) | ✓ | | |
| 6 | French Flat Middle (2017 data) | ✓ | | |
| 7 | French Flat North (1999 data) | | | U |
| 8 | French Flat Piney Woods (2017 data) | ✓ | | |
| 9 | French Flat South (2017 data) | | | U |
| 10 | Illinois River Forks State Park | ✓ | | |
| 11 | Illinois River Woodland (2017 data) | | | U |
| 12 | Indian Hill (2017 data) | ✓ | | |
| 13 | ODOT Highway 46 SMA (2018 data) | ✓ | | |
| 14 | Laurel Road (2017 data) | ✓ | | |
| 15 | Reeves Creek Middle (BLM) (1991 data) | | | U |
| 16 | Reeves Creek North 1 (2015 data) | ✓ | | |
| 17 | Reeves Creek North 2 (2015 data) | ✓ | | |
| 18 | Reeves Creek South (1991 data) | | | U |
| 19 | Riverwash (2017 data) | ✓ | | |
| 20 | Rough and Ready Creek (2019 data) | ✓ | | |
| 21 | Waldo Road (2010 data) <i>New population</i> | ✓ | | |
| 22 | Waldo South (2010 data) | | | U |
| 23 | Woodcock Mountain Westside Road (2019 data) | ✓ | | |
| 24 | Woodcock Mountain (1991 data) | | | U |
| 25 | Woodcock Bog RNA (2018 data) | | | U |
| Rogue Valley Recovery Zone | | | | |
| 26 | Agate Desert Preserve The Nature Conservancy/MWC property (2019 data) | ✓ | | |
| 27 | Corey Road (2001 data) | | | U |
| 28 | Highway 140 East (2001 data) | | | U |
| 29 | JCURA and Jackson Sports Park (2019 data) | ✓ | | |
| 30 | ODFW Denman Wildlife Area Hall Tract (2015 data) | ✓ | | |
| 31 | ODOT Highway 140 SMA (2009 data) | ✓ | | |
| 32 | ODOT Vernal Pool Conservation/Mitigation Bank/KPMS/Whetstone Preserve (2019 data) | ✓ | | |
| 33 | Raven Road (2008 data) | | ✓ | |
| 34 | Rogue Airport (2018 data) | ✓ | | |
| 35 | White City 1 (1987 data) | | | U |
| 36 | White City 2 (1987 data) | | | U |

U = Unknown denotes a population that has not been visited in over 10 years or plants have not been detected after a site visit. A population is considered extirpated when the site has obviously been developed or plants have not been observed at the location after three visits. The BLM uses a Geographic Biotic Observations (GeoBOB) database to document population status. We utilized an ArcGIS shapefile to access the most recent GeoBOB records from BLM lands in the Illinois Valley (Josephine County) (BLM 2019). TNC, OPRD, BOR, and ODOT provided count information via e-mail either in the message or with a plant record attachment. USFWS observations were documented in a Service memo (USFWS 2019).

7. The Woodcock Mountain Westside Road population occurs on privately held lands, is relatively robust and stable, and exceeds 4,000 plants as of 2019 (G. Bennett, pers. comm. 2019). The plants occur within open meadow with scattered conifers and thickets of wedge-leaf buckbrush (*Ceanothus cuneatus*).
8. ODOT reported that the *Lomatium cookii* at the Highway 46 Special Management Area have been on an increasing trend. In 2018, 2,900 plants were documented in all age-classes, which represents a 483 percent increase since 1988, when only 600 plants were observed. The population occurs on roadside gravel and extends into unmaintained open forest habitat. Since 2003, ODOT has stopped using herbicide at the site and has restricted roadside mowing to outside of the plant's growing window. Likewise ODOT has performed small roadside maintenance activities at the site over the years extending the paved shoulder area to improve roadside safety and have replaced gravel from time to time (D. Sharp, pers. comm. 2019).
9. The *Lomatium cookii* occurring at Rough and Ready Creek has been stable in portions of the population, which extends across both public (BLM) and private lands (Pfungsten *et al.* 2017, pp. 15-23). BLM initiated the Rough and Ready Creek ACEC monitoring in 1994, documenting 278 plants within the ACEC. In 2011, an all-time high count of 2,830 plants was documented, but most recently, in 2017, 1,642 plants were documented, a 10 percent decline from 2016. On the BLM portion of the population, numbers have fluctuated over the last 14 years, and have been averaging around 2,000 plants for the last 8 years, with no detectable long-term declining or increasing trends. However, on the private lands there have been no surveys and the population is unmanaged.
10. The Indian Hill *Lomatium cookii* population occurs on BLM land and occurs within a narrow open band bordered by forest on all sides. BLM, with the assistance of the Service, has funded vegetation management at the property for several years, and has widened the clearing significantly. The population was estimated to have approximately 7,213 (+/- 4,298) plants in 2017, which is average. The highest count for plants was 12,898 (+/- 11,874) in 2005 and the lowest was 5,704 (+/- 3,904) in 2000 (Pfungsten *et al.* 2017, p. 37).
11. The Waldo Road population occurs on an open roadside area, and is newly documented since the last 5-year review for *Lomatium cookii*. It was last observed in 2010 with 53 plants documented (USFWS 2019).
12. *Lomatium cookii* at the ODOT Danna Lytjen Special Management Area (referred to in Table 1 as the "Riverwash" site) was first documented in 2004. The population at one time documented 70 plants. Since roadside improvement activities were conducted in 2017, the population has declined to a single plant in 2017 (D. Sharp, pers. comm. 2019).
13. The Illinois River Forks State Park is owned and managed by OPRD. Two portions of the population are monitored. The upper portion is monitored with transects and the lower portion is monitored with quadrats. The 2019 monitoring documented the lower portion has declined 56 percent from the previous year, from 160 to 70 plants, likely due

to early year flooding. The upper portion declined about 47 percent, to approximately 145 plants, but this was very close to the 10-year average of 150 plants. The property has been fenced-off from the road and picnic areas to deter traffic (N. Bacheller, pers. comm. 2019).

Figure 1. *Lomatium cookii* populations in the Illinois Valley, Josephine County (USFWS 2019)

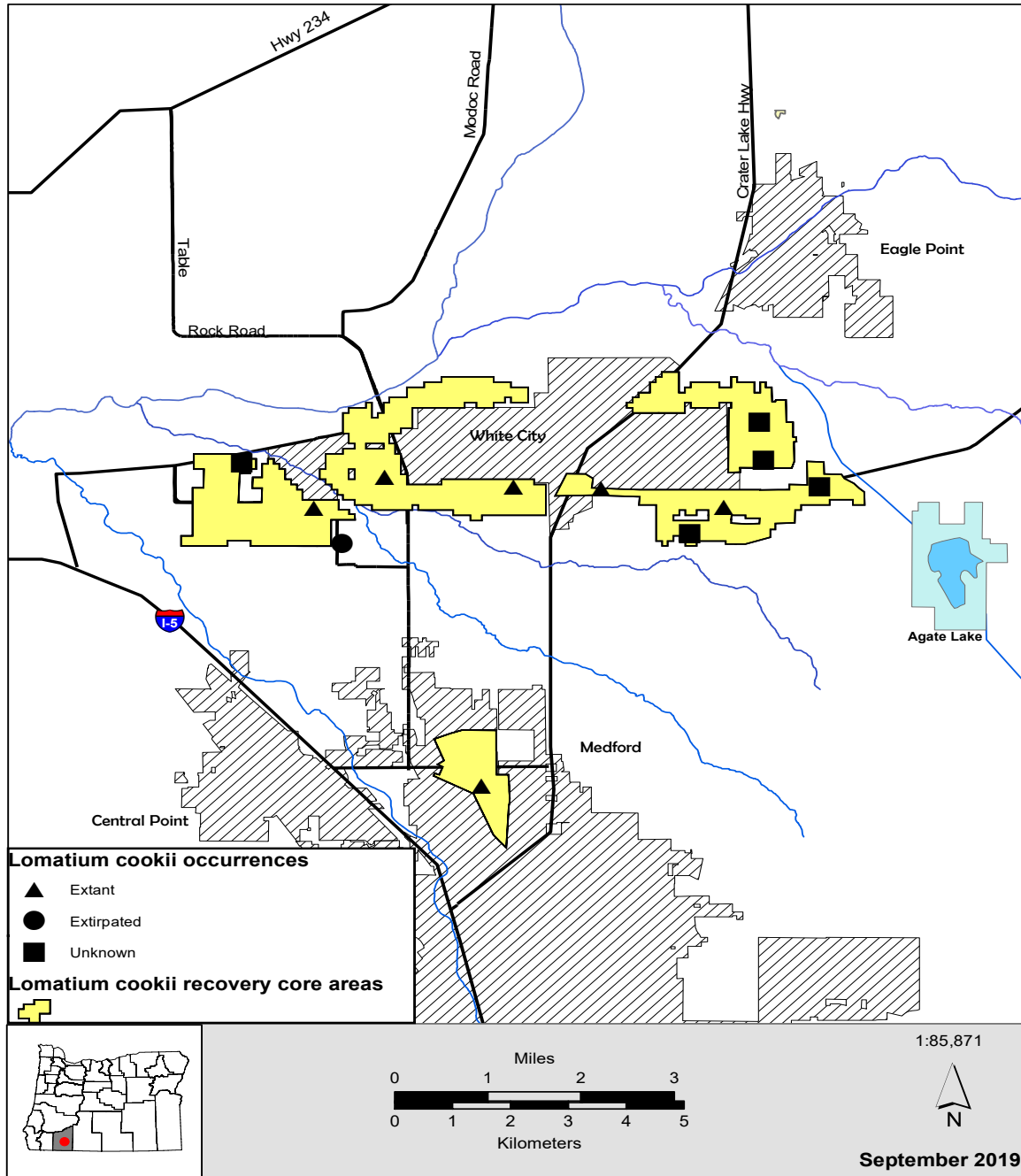


Rogue River Valley (11 populations: 6 with current records, 4 with unknown status, 1 extirpated. Figure 2.)

1. The ODOT Vernal Pool Conservation and Mitigation Bank (ODOT Bank) in Central Point Oregon, has introduced and expanded the range of *Lomatium cookii* within the Whetstone Recovery Core Area. ODOT collected *Lomatium cookii* seed from a road construction work area, which was successfully bulked at the J. Herbert Stone Nursery and subsequently used to establish a population of *L. cookii* at the ODOT Bank (P. Benton, pers. comm. 2015). *Lomatium cookii* seed was planted in 2009, 2012, 2014, and 2015 into 76 macroplots and several restoration zones. Excess seed will be stored at the Herbert Stone Nursery and the Rae Selling Seed Bank. Since 2009, when the initial planting took place, the *L. cookii* population has grown within the ODOT Bank, from no plants in 2009 to over 813 plants within 30 acres (ac) (12.14 hectares (ha)) in 2018 (ODOT 2019, p. 3).
2. In 2013, the Jackson County Urban Renewal Agency (JCURA) introduced *Lomatium cookii* to a new mitigation area on Jackson County property (Sports Park) to compensate for impacts to vernal pool habitat in White City. The Agency had established approximately five patches of plants ranging from 15 to 200 individuals (270 plants total) within an 11-ac (4.5 ha) mitigation area to augment the population on the 70-ac (28-ha) property (Terra Science 2016, p. 4). A new road is planned to be constructed in 2020-2021, which will bisect the Park and impact one to two existing *L. cookii* patches that occur within several feet of the proposed road. To offset impacts, compensation is proposed to establish additional plants on-site.
3. The ODOT Special Management Area along Hwy 140 has not been monitored since 2009. In 2009, the most recent monitoring visit, 54 *Lomatium cookii* plants of all age classes were observed, indicating successful reproduction and recruitment at this site. ODOT has discontinued monitoring this population, as it falls outside the roadside maintenance area (ODOT 2009).
4. The Rogue Valley International Airport population is not monitored annually, but based on several recent site visits conducted by Service staff in 2019, the *Lomatium cookii* population appears robust and unchanged since previous visits. Over time, the airport is anticipated to expand. The Rogue Airport *L. cookii* population receives consistent maintenance by mowing, and this appears to control competing vegetation, allowing the plant to flourish. The Service is aware of several airport development projects scheduled within the next 10 years, which are anticipated to affect several small *L. cookii* patches. The airport proposes to compensate these impacts with on-site mitigation involving new plant establishment (USFWS 2019).
5. The TNC Agate Desert Preserve's *Lomatium cookii* population has expanded in size and quantity. TNC conducted a prescribed burn on the property in 2017 and seeded *L. cookii* in appropriate habitat across the property. *Lomatium cookii* has responded with vigorous growth, increased germination, and has become established in new areas within the property (M. Morison, pers. comm. 2019).

- The Denman Hall Tract *Lomatium cookii* population occurs on ODFW property and receives no management. In 2012, the population reportedly had 1,839 plants, down from 3,481 plants in 2008. Most of the flowering plants were found in the path of the Pacific Power transmission line access route, an area regularly disturbed by light vehicle traffic that has kept down competing vegetation growth and thatch accumulation (K. Perchemlides, pers. comm. 2012).

Figure 2. *Lomatium cookii* populations in the Rogue Valley, Jackson County (USFWS 2019)



Since the adoption of the 2012 recovery plan, *Lomatium cookii* remains at 36 known populations (or occurrences), with 1 new population (Waldo Road) documented and the Raven Road population lost (Table 1; Figure 2). The new population of 53 plants at the Waldo Road population was discovered in 2010 by Service biologist Sam Friedman on a roadside right-of-way on Jackson County. At the 20 some locations with consistent monitoring (provided above), the data suggests mostly stable to increasing numbers of *L. cookii* currently. Monitoring of the 15 remaining populations is either not currently occurring or there is difficulty relocating known populations, therefore the status of those populations is unknown, but we have no reason to expect that they have become extirpated. We cannot rule out the possibility, however, that they may be declining due to either uncontrolled grazing or management not well suited for *L. cookii*. Some of the sites may not have active vegetation management and, as a result, competition could be negatively affecting the populations. However, apart from the loss of the Raven Road population, we are not aware of any new diseases, predation, illegal or excessive collecting for scientific or commercial uses, significant plant loss due to development, chemical spills, or widespread land erosion occurring that could be negatively affecting the species. In addition, we know that development has not taken place on these sites, which would result in the extirpation of the known populations. For these reasons, we conclude it is reasonable to assume for the purposes of this review that these populations remain extant.

Distribution. Based on representative population assessments at the monitored locations provided above, as well as assuming the other known populations are still occupied by *Lomatium cookii*, we conclude the overall distribution remains unchanged. *Lomatium cookii* remains concentrated within the Illinois and Rogue River Valleys of southwestern Oregon and within its known historical range. Even with the extirpation of one population and the addition of one populations, range contraction or expansion of the species has not occurred.

Threats. Since the 2011 *Lomatium cookii* 5-year review, the threats remain the same or similar and no new significant threats and no significant new information regarding the species' biological status are known to warrant a change in the Federal listing status of this species. However, recently the Environmental Protection Agency proposed a change in the legal definitions of "wetlands of the United States" as defined by the Clean Water Act, which has the potential to affect *L. cookii* since it occurs in vernal pools and other seasonally wet habitats (February 14, 2019; 84 FR 4154). Although southern Oregon's vernal pools were formerly considered "jurisdictional wetlands" under section 404 of the Clean Water Act (33 USC 1344), such that the U.S. Army Corps of Engineers (Corps) would require a permit for the alteration of those wetlands, under the proposed new rules vernal pools would be considered isolated wetlands. This could terminate Corps oversight of southern Oregon vernal pools as jurisdictional wetlands, but often Corps Managers will consider the vernal pools as "preliminary jurisdictional wetlands" based on assumed subsurface connectivity to streams (N. Edwards, pers. comm. 2019). Applicants pursuing development within vernal pool habitat may still be required to obtain a wetland permit with the Oregon Department of State Lands (DSL) and be held to wetland mitigation requirements similar to those in place before the recent regulatory changes. The Service will continue to utilize the 2011 Vernal Pool Conservation Strategy Biological Opinion to address development in the Rogue River Valley. This document will assist in the preservation of *Lomatium cookii* and facilitate the conservation of the largest intact parcels of

vernal pool habitat (See **Conservation**, below). This strategy includes continuing to facilitate acquisition and protection of highest quality habitat.

Conservation. In the Rogue River Valley, the Service is directing the conservation of *Lomatium cookii* through community efforts and a region-wide vernal pool conservation strategy as referenced in the 2011 Vernal Pool Conservation Strategy Biological Opinion (U.S. Fish and Wildlife Service 2011b, entire). In galvanizing public support and in implementing the conservation strategy, the Vernal Pool Information Network (VPIN) has played a prominent role in gathering key landowners, local and State agency staff, municipal staff, conservation organizations, land trusts, the scientific community, and any interested parties involved together in vernal pool management discussions and site tours. This network has been effective in sharing common vernal pool management knowledge between the agencies, organizations, and the local landowners.

In 2011, the Service signed a Vernal Pool Biological Opinion that provides Endangered Species Act (ESA) Section 7 consultation coverage over a wide suite of both developmental or conservation activities with the express purpose of implementing a vernal pool conservation strategy. The consultation provides ESA coverage to the Corps and other Federal agencies, and provides guidance to various non-federal entities working within vernal pool habitat in the Rogue Valley (U.S. Fish and Wildlife Service 2011b, pp. 4-5, 16).

The Conservation Strategy includes the following:

- Targets for vernal pool complex habitat protection, restoration and enhancement; Guidance, best management practices, and performance standards for vernal pool complex and vernal pool species restoration and management;
- Prioritized use of credits available from conservation banks, mitigation banks, or equivalent conservation or mitigation projects (in conjunction with on-site best management practices and performance standards) as the most credible method to minimize the effects and significance of unavoidable impacts to listed vernal pool species that might result from otherwise lawful development activities in vernal pool complexes;
- Thresholds, criteria, ratios, and other factors that will determine establishment of appropriate credits and credit allocation to banks or equivalent conservation or mitigation projects and appropriate and effective use of these credits to address the adverse impacts of development projects, enabling Corps, and/or DSL-approved wetland banks and credits established consistent with the above factors to also serve as species conservation banks and credits under the ESA;
- Streamlined regulatory review and approval of certain conservation and development activities within vernal pool complexes via use of a single suite of standards and processes by the Corps, DSL, and the Service; and

- Common expectations and reasonable certainty about the standards and requirements for engaging in vernal pool complex development and conservation activities for landowners, developers, habitat managers, and others.

The ability to salvage, propagate and successfully transplant *Lomatium cookii* seed shows promise in advancing restoration of suitable sites. For example, ODOT has successfully salvaged and bulked seed of *L. cookii* at the J. Herbert Stone Nursery in Central Point, Oregon. The motivation for seed bulking is for ODOT to compensate for vernal pool habitat impacts experienced in the 2016 construction of the Oregon Highway 62 Corridor Solutions Project. The bulking resulted in the production of approximately 30 pounds of seed (P. Benton, pers. comm. 2015) and a portion of the seed was sowed into the ODOT Vernal Pool Mitigation and Conservation Bank and the adjoining Kincaid Property Mound Site. The *L. cookii* population has since expanded from approximately 6.07 to 12.1 hectares (15 to 30 acres) and from about 50 individual plants to over 813 plants at the ODOT properties (ODOT 2019).

Many Federal, State, and local partners, including private landowners, are actively engaged in conservation efforts for the benefit of *Lomatium cookii*. Since 2002, the amount of hectares (acres) of protected *L. cookii* habitat has increased from 603.8 hectares (1,492 acres) to 1,041.6 hectares (2,574 acres) (Appendix A, Table A-1). Although recovery efforts are progressing, we have not yet reached the point that a change in the Federal status of the species is suggested.

Recovery Criteria. Appendix A provides a summary of the status of the species relative to the downlisting and delisting criteria established for *Lomatium cookii* in the Recovery Plan for Rogue and Illinois Valley Vernal Pool and Wet Meadow Ecosystems (U.S. Fish and Wildlife Service 2012, pp. IV-26 to IV-27). Some of the criteria have been partially met for some of the frequently monitored populations at several core areas, but none of the criteria have yet been fully achieved.

Recommendations for Future Actions:


- Develop conservation easements or conservation programs for existing occurrences of *Lomatium cookii* on private lands.
- Make visits to historical *Lomatium cookii* occurrences in the Illinois and Rogue Valleys to determine whether the plants are still present or have become extirpated.
- Augment *Lomatium cookii* on protected habitat in appropriate locations in the Illinois and Rogue Valley areas.
- Conduct best management practices studies for *Lomatium cookii*.

Conclusion:

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*.

After reviewing the best available scientific information, we conclude that *Lomatium cookii* remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the ESA and analysis of the status of the species in our 2011 status review remains an accurate reflection of the species current status.

Lead Field Supervisor, Fish and Wildlife Service

Approve  Date 10/1/19

Appendix A. Status of the Species Relative to Recovery Criteria

Appendix B. 5-Year Review conducted in 2011

Appendix A. Status of the Species Relative to Recovery Criteria

The Recovery Plan (U.S. Fish and Wildlife Service 2012, pp. IV-27 to IV-28) recommends the following reclassification criteria for *Lomatium cookii*; the status of the species relative to these criteria is presented in italic type following each criterion.

Downlisting:

- a. At least 32 of the 36 documented and extant occurrences (approximately 90 percent) have been protected from development. If extant occurrences become extirpated, protection of reintroduced or introduced occurrences may be substituted. Introduced or newly discovered populations outside of currently known core areas may be substituted if deemed equivalent in their contribution to recovery.

Currently 23 documented occurrences are protected from development, of which 19 are confirmed extant.

Delisting (U.S. Fish and Wildlife Service 2012, p. IV-29):

- a. Status surveys, status reviews, and population monitoring show the populations are self-sustaining. Population trends must be shown to be stable, increasing or exhibiting only slight declines from high population levels during a 10-year period prior to consideration following downlisting (e.g., evidence of reproduction and recruitment) and have been determined to be stable, increasing or showing only minor declines from high population levels, and implementation of management plans is effectively managing or eliminating threats.

This criterion has been met for the frequently monitored populations, but has not been met overall.

- b. At least 34 occurrences (approximately 95 percent of documented/extant occurrences) have been protected from development. If extant occurrences become extirpated, protection of reintroduced or introduced occurrences may be substituted. Introduced or newly discovered populations outside of currently known core areas may be substituted if deemed equivalent in their contribution to recovery.

*To date, 23 *Lomatium cookii* populations are protected (60 percent).*

- c. At least 95 percent of suitable vernal pool/wet meadow habitat acreage within each Priority 1 core area and 90 percent of suitable vernal pool/wet meadow habitat acreage within Priority 2 core areas has been protected from development. All suitable vernal pool and wet meadow habitat must include soils and hydrology that support *Lomatium cookii* as appropriate. Reintroductions and introductions are accomplished, as necessary and applicable, to replace populations where status surveys indicate the species has been extirpated.

To date, 12 percent of Priority 1 core areas and 26 percent of Priority 2 core areas are protected.

- d. A post-delisting monitoring plan has been developed for this species.

None of the above criteria have been fully met.

Table A-1. *Lomatium cookii* protected hectares from listing to this 2019 5-year review

| Listing | Recovery core areas with protected habitat | Hectares (Acres) protected |
|--|---|-----------------------------------|
| 2002 (listing) | 15/17 | 603.8 (1,492) |
| 2006 draft Recovery Plan | 15/17 | 672.6 (1,662) |
| 2010 (critical habitat/5- year review) | 15/17 | 723.2 (1,787) |
| 2012 Recovery Plan | 15/17 | 1,013.3 (2,504) |
| 2019 2 nd 5-year review | 15/17 | 1,041.6 (2,574) |

Appendix B. 5-Year Review conducted in 2011.

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:

Sam Friedman, Botanist, Roseburg Field Office, (541) 957-3478.

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 eglanteria*), 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.

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Appendix A. *Lomatium cookii* Action Plan

| Responsible office: Roseburg Field Office // Area: Jackson and Josephine counties, Oregon | | | | | | | | | | September 25, 2011 | | | | | | | | | |
|---|---|--|-------|----------|---------------------------|-----------------|-----------------|-----------------|-----------------|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|--|--|--|
| Priority | Strategic Action | Tasks | State | Priority | Implementing Party | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | | | | | |
| | | | | | | Funding request | Funding secured | Funding request | Funding secured | Funding request | Funding secured | Funding request | Funding secured | Funding request | Funding secured | | | | |
| 1 | Protect and Manage existing <i>Cook's</i> <i>Lomatium</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 | \$0 | 80 Bio Hrs | \$0 | | | | |
| | | Assist the Denman Wildlife Area with desert parsley habitat restoration | OR | 4 | FWS, ODFW | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | | | | |
| | | Assist the Medford BLM with desert parsley habitat restoration | OR | 3 | FWS*, ODFW, TNC | | \$0 | | \$0 | \$5,000 | \$0 | | \$0 | \$5,000 | \$0 | | | | |
| | | Assist Jackson County Parks with desert parsley habitat protection and restoration | OR | 6 | FWS, COUNTY | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | | | | |
| | | Assist TNC with desert parsley habitat restoration | OR | 7 | FWS, OCA, TNC, ODFW | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | \$5,000 | \$0 | | | | |
| 2 | Propagate plants to reintroduce and augment existing populations to enhance viability | Collect seed from each population targeting private lands | OR | 4 | FWS*, OPRD | \$3,000 | \$0 | \$3,000 | \$0 | | \$0 | \$3,000 | \$0 | \$3,000 | \$0 | | | | |
| | | Refine outplanting techniques | OR | 6 | FWS, OCA, ODOT | \$4,000 | \$0 | \$4,000 | \$0 | \$8,000 | \$0 | \$5,000 | \$0 | \$3,000 | \$0 | | | | |
| | | Identify new protected locations to reintroduce or augment | OR | 7 | FWS, OCA, ODOT, TNC | \$10,000 | 0 | \$10,000 | \$0 | \$10,000 | 0 | \$10,000 | \$0 | \$10,000 | 0 | | | | |
| | | Augment desert parsley at protected suitable habitat in Jackson County | OR | 9 | FWS, OCA, County | \$10,000 | \$0 | \$10,000 | \$0 | \$10,000 | \$0 | \$0 | \$0 | \$10,000 | \$0 | | | | |
| 3 | Conduct research essential to the conservation of the species | Augment desert parsley at protected suitable habitat in Josephine County | OR | 10 | FWS*, OCA, BLM* | \$10,000 | \$0 | \$10,000 | \$10,000 | \$0 | \$10,000 | \$0 | \$0 | \$10,000 | \$0 | | | | |
| | | Research rodent enclosure management on suitable habitat** | OR | 11 | FWS, County | \$40,000 | \$0 | \$40,000 | \$0 | 40 Bio Hrs | \$0 | 40 Bio Hrs | \$0 | | | | | | |
| | | Research mowing and grazing management on suitable habitat | OR | 12 | FWS, OCA, Land trust | \$40,000 | \$0 | \$40,000 | \$40,000 | \$0 | \$40,000 | \$0 | | | | | | | |

U.S. FISH AND WILDLIFE SERVICE

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 Thirill

Date 9-27-2011

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