

Interim Core Map Documentation for the Cook's Lomatium

Date Uploaded to EPA's GeoPlatform: September 2025

Interim Core Map Developer: U.S. Environmental Protection Agency (EPA), Office of Pesticide Programs

Species Summary

The Cook's lomatium (*Lomatium cookii*; Entity ID #1263) is an endangered perennial forb occurring in vernal pools, seasonally wet meadows, sloped mixed-conifer forest openings, wet-serpentine-derived grassland meadows, and along roadside edges in the Jackson and Josephine counties of southwest Oregon. There is a designated critical habitat for this species. Additional information is provided in **Appendix 1**.

Description of Core Map

The core map for the Cook's lomatium is biological information type. Most of the core map is comprised of the designated critical habitat with additions of extant and unknown populations documented to occur outside of the critical habitat. **Figure 1** depicts the interim core map for the Cook's lomatium (green areas on map). The core map represents approximately 8,400 acres.

The Cook's lomatium inhabits vernal pools, seasonally wet meadows, sloped mixed-conifer forest openings, wet-serpentine-derived grassland meadows, and roadside edges in the Jackson and Josephine counties of southwest Oregon. Landcover categories within the core map are included in **Table 1**. Landcover is predominantly evergreen forest and scrub/shrub.

The core map developed for the Cook's lomatium is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the Cook's lomatium. This core map incorporates information developed by the U.S. Fish and Wildlife Service (FWS) and made available to the public; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate species expert feedback from FWS. This interim core map has an "limited" (2) best professional judgment classification to describe major uncertainties/limitations. The map is based on known locations described by FWS, and EPA removed some additional areas based on biological needs of the species. This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

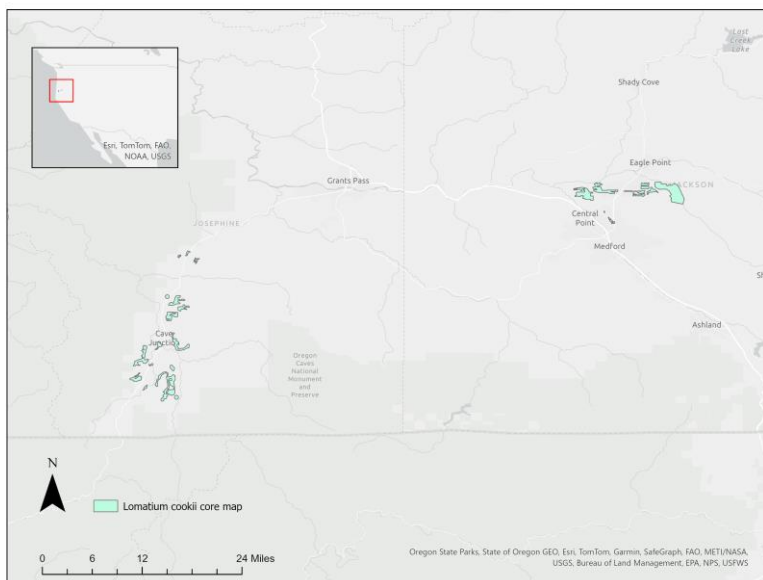


Figure 1. Interim core map for the Cook’s lomatium. The total acreage of the core map is approximately 8,400 acres.

Table 1. Percentage of Interim Core Map Represented by NLCD¹ Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Landcover (Value)	% of core map represented by landcover	% of core map represented by example pesticide use
Forestry	Deciduous Forest (41)	0%	75%
Forestry	Evergreen Forest (42)	74%	75%
Forestry	Mixed Forest (43)	1%	75%
Agriculture	Pasture/Hay (81)	2%	2%
Agriculture	Cultivated Crops (82)	0%	2%
Mosquito adulticide, residential	Open space, developed (21)	4%	6%
Mosquito adulticide, residential	Developed, Low intensity (22)	1%	6%
Mosquito adulticide, residential	Developed, Medium intensity (23)	0%	6%
Mosquito adulticide, residential	Developed, High intensity (24)	0%	6%
Invasive species control	Woody Wetlands (90)	1%	17%
Invasive species control	Emergent Herbaceous Wetlands (95)	0%	17%
Invasive species control	Open water (11)	0%	17%
Invasive species control	Grassland/herbaceous (71)	3%	17%
Invasive species control	Scrub/shrub (52)	13%	17%
Invasive species control	Barren land (rock/sand/clay; 31)	0%	17%
Total Acres	Interim Core Map Acres	~8,400	

Evaluation of Known Location Information

There are four datasets with known location information for this species:

- Descriptions of locations provided by FWS,
- Occurrence locations in iNaturalist;
- Occurrence locations in the Global Biodiversity Information Facility (GBIF); and
- Occurrence locations in NatureServe.

Currently, there are 40 populations in the Rogue and Illinois Valleys, 13 of which are extant or have current records, five of which are likely extirpated, and the remainder have an unknown status. iNaturalist had 30 research grade observations. GBIF contained no additional data that were not already included in iNaturalist or NatureServe. Observations generally appear to be consistent with the locations of the range and critical habitat. **Appendix 1** includes more information on the available known location information.

Approach Used to Create Core Map

The core map was developed using the “Process EPA Uses to Develop Core Maps for Draft Pesticide Use Limitation Areas for Species Listed by the U.S. Fish & Wildlife Service (FWS) and their Designated Critical Habitats”² (referred to as “the process”). This core map was developed by EPA and was developed using the 4 steps described in the process document:

1. Compile available information for a species;
2. Identify core map type;
3. Develop the core map for the species; and
4. Document the core map.

For step 1, EPA compiled available information for the Cook’s lomatium as well as observational information available from various publicly available sources (discussed in previous section). The information compiled for the Cook’s lomatium is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- Occurrences and known locations are in the Rogue and Illinois Valleys in southwest Oregon.
- Most occurrences occur within the critical habitat, while the core map has been expanded to contain those occurring outside of it.

For step 2, EPA used the compiled information to identify the core map type, including the species range, critical habitat, and known location information. EPA compared known location data to the range and critical habitat and found that the FWS known locations of currently existing (extant) populations are consistent with the location of the designated critical habitat. The species range follows geopolitical boundaries (i.e., counties) and is not likely limited to the areas containing habitat of the species. The range is also much larger than the areas where known locations occur. Based on this information, EPA used the designated critical habitat as the primary basis of the core map.

For step 3, EPA used the designated critical habitat and extant/unknown occurrences provided by FWS for the Cook’s lomatium. EPA downloaded the critical habitat from FWS’s ECOS (<https://ecos.fws.gov/ecp/>).

Discussion of Approaches and Data that were Considered but not Included in Core Map

Alternative approaches and data not described in this documentation were not explored in the development of this interim core map.

Appendix 1. Information Compiled for Species During Step 1

1. Recent FWS Documents/Links

- [Cook's Lomatium 5-Year Review](#) – (2024)
- [Designation of Critical Habitat for *Limnanthes floccosa* ssp. *grandiflora* \(Large-Flowered Woolly Meadowfoam\) and *Lomatium cookii*](#) – (2010)
- [Cook's Lomatium Recovery Plan](#) – (2012)

2. Background information

- Status: Federally listed as endangered in 2002
- Resiliency, redundancy, and representation (the 3Rs) from 2012 Recovery Plan:
 - Lomatium cookii in the Rogue Valley is known from 13 occurrences, of which 6 are extant, 6 are unknown in current status, and 1 is extirpated. Population census results at the Agate Desert Preserve between 1997 and 2007 indicate a fluctuating but gradual decline in Lomatium cookii numbers, ranging from a high of 5,000 in 1997 to a low of 1,800 in 2002 (M. Morison, pers. comm. 2012). The most recent L. cookii census, in 2011, estimated only 1,710 plants. Surveys at an Oregon Department of Transportation Special Management Area along Highway 140 have found fluctuating populations: 200 plants observed in 1992, decreasing to 26 plants in 2000 and 60 plants in 2004, and most recently increasing to 160 plants in 2009 (D. Sharp, pers. comm. 2009, 2010, 2012). On private land in central White City, a population numbering 2,000 individuals was documented in 1992 but was partially extirpated due to development (Oregon Natural Heritage Information Center 2008). Several populations on the Hall Tract of the Denman Wildlife Area decreased in size from an original estimate of 700 to 1,000 plants in 1992 to an estimate of 500 plants in 2000, but were estimated to contain 3,000 plants in 2008. During 2001, roughly 500,000 individuals were observed in a single population of L. cookii on private property in White City II-21 (Oregon Natural Heritage Information Center 2008). The current estimated population size at the Rogue Valley International-Medford Airport is approximately 5,000 plants (U.S. Fish and Wildlife Service 2008). In the Illinois Valley, Lomatium cookii numbers at Bureau of Land Management monitoring sites in Rough and Ready Creek and French Flat have fluctuated due to environmental conditions, but typically fall within a range of acceptable variation (Kaye 2006; T. Kaye, pers. comm. 2004). At least 5 significant Lomatium cookii populations, respectively numbering approximately 12,000, 92,500, 57,700, 200, and 50 plants, occur in the French Flat area. A survey along an Oregon Department of Transportation Special Management Area along Highway 46 in 2005 reported approximately 1,095 plants, which was up from the 1,035 plants observed in 2003 (K. Cannon, pers. comm. 2005).

- **Habitat, Life History, and Ecology (Source: 2012 Recovery Plan)**
Habitat: “*Lomatium cookii* grows on seasonally wet soils in both the Rogue Valley and the Illinois Valley. For much of its range in the Rogue Valley, the plant occurs on upland mounds, at the bottom of vernal pools, and on flanks of vernal pools in rocky or fine-grained soils. It occurs in either strongly expressed or weakly expressed vernal pool formations. At one location it grows through roadside gravel.”
- **Reproduction/pollinators:**
 - Flowers from late March to May and is pollinated entirely by insects.
- **Taxonomy**
 - Flowering dicot plant
- **Essential Physical Biological Features (PBFs) for Designated Critical Habitat:**
 - Rogue River Valley: (A) Vernal pools and ephemeral wetlands and depths and the adjacent upland margins of these depressions that hold water for a sufficient length of time to sustain *Lomatium cookii* germination, growth, and reproduction. These vernal pools or ephemeral wetlands support native plant populations and are seasonally inundated during wet years but do not necessarily fill with water every year due to natural variability in rainfall. Areas of sufficient size and quality are likely to have the following characteristics: • Elevations from 372 to 411 m (1,220 to 1,350 ft); • Associated dominant native plants including, but not limited to: *Alopecurus saccatus*, *Achnatherum lemmonii*, *Deschampsia danthonioides*, *Eryngium petiolatum*, *Lasthenia californica*, *Myosurus minimus*, *Navarretia leucocephala* ssp. *leucocephala*, *Phlox gracilis*, *Plagiobothrys bracteatus*, *Trifolium depauperatum*, and *Triteleia hyacinthina*; and • A minimum area of 8 ha (20 ac) to provide intact hydrology and protection from development and weed sources. (B) The hydrologically and ecologically functional system of interconnected pools or ephemeral wetlands or depressions within a matrix of surrounding uplands that together form vernal pool complexes within the greater watershed. The associated features may include the pool basin and ephemeral wetlands; an intact hardpan subsoil underlying the surface soils up to 0.75 m (2.5 ft) in depth; and surrounding uplands, including mound topography and other geographic and edaphic features that support systems of hydrologically interconnected pools and other ephemeral wetlands (which may vary in extent depending on site specific characteristics of pool size and depth, soil type, and hardpan depth). (C) Silt, loam, and clay soils that are of ultramafic and nonultramafic alluvial origin, with a 0 to 3 percent slope, classified as Agate–Winlo or Provig–Agate soils. (D) No or negligible presence of competitive, nonnative invasive plant species. Negligible is defined for the purpose of this rulemaking as a minimal level of nonnative plant species that will still allow *Lomatium cookii* to continue to survive and recover.
 - Illinois River Valley: (A) Wet meadows in oak and pine forests, sloped mixed-conifer openings, and shrubby plant communities that are seasonally inundated

and support native plant populations. Areas of sufficient size and quality are likely to have the following characteristics: • Elevations from 383 to 488 m (1,256 to 1,600 ft); • Associated dominant native plants including, but not limited to: *Achnatherum lemmonii*, *Arbutus menziesii*, *Arctostaphylos viscida*, *Camassia* spp., *Ceanothus cuneatus*, *Danthonia californica*, *Deschampsia cespitosa*, *Festuca roemerii* var. *klamathensis*, *Poa secunda*, *Ranunculus occidentalis*, and *Limnanthes gracilis* var. *gracilis*; • Occurrence primarily in bottomland *Quercus garryana*–*Quercus kelloggii*–*Pinus ponderosa* (Oregon white oak–California black oak–ponderosa pine) forest openings along seasonal creeks; and • A minimum area of 8 ha (20 ac) to provide intact hydrology and protection from development and weed sources. (B) The hydrologically and ecologically functional system of streams, slopes, and wooded systems that surround and maintain seasonally wet alluvial meadows underlain by relatively undisturbed ultramafic soils within the greater watershed. (C) Silt, loam, and clay soils that are of ultramafic and nonultramafic alluvial origin, with a 0 to 40 percent slope, classified as Abegg gravelly loam, Brockman clay loam, Copsey clay, Cornutt–Dubakel complex, Dumps, Eightlar extremely stony clay, Evans loam, Foehlin gravelly loam, Josephine gravelly loam, Kerby loam, Newberg fine sandy loam, Pearsoll–Rock outcrop complex, Pollard loam, Riverwash, Speaker–Josephine gravelly loam, Takilma cobbly loam, or Takilma Variant extremely cobbly loam. (D) No or negligible presence of competitive, nonnative invasive plant species. Negligible is defined for the purpose of this rulemaking as a minimal level of nonnative plant species that will still allow *Lomatium cookii* to continue to survive and recover. The need for space for individual and population growth, germination, seed dispersal, and reproduction is provided by PCEs 1(A), 2(A), 1(D), and 2(D); the need for soil moisture for growth, germination, reproduction, and seed dispersal is provided by PCEs 1(B) and 2(B)(but not necessarily every year); the need for other nutritional or physiological requirements for the species is provided by PCE 1(C) and 2(C); the need for habitat free from disturbance that allows for sufficient reproduction and survival opportunities is provided by PCEs 1(A), 2(A), 1(D), and 2(D). All the above described PCEs do not have to occur simultaneously within a unit for the unit to constitute critical habitat for *Lomatium cookii*.

- **Relevant Pesticide Use Sites in FWS Documents**
 - Pesticide threats to the species listed in FWS documents include: pesticides used on rangelands that are sprayed directly onto vernal pools; mosquito abatement activities in the Rogue Valley (do not include applications to vernal pools); fertilizer and pesticide run-off into vernal pools.
- **Relevant Recovery Criteria and Actions (Source: 2012 Recovery Plan)**
 - Downlisting criteria include:
 - At least 32 of 36 documented/extant *Lomatium cookii* 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.

- At least 90 percent of suitable habitat acreage within each Priority 1 core area (one core area in the Rogue Valley and seven core areas in the Illinois Valley) has been protected from development. At least 85 percent of suitable habitat acreage within Priority 2 core areas (three core areas in the Rogue Valley and six core areas in the Illinois Valley) has been protected from development. (See Tables IV-1, IV-2, and IV-4). All suitable vernal pool and wet meadow habitat must include soils and hydrology that IV-28 support *Lomatium cookii*. This habitat includes both occupied and suitable habitat. Suitable habitat that is not currently known to be occupied must be protected to provide for corridors and dispersal habitat, restoration dynamics, provide for reintroduction/introduction sites, and to protect currently undiscovered populations.
- Management plans for each protected core area are developed and implemented as soon as feasible for *Lomatium cookii* protection and conservation. The management plans should address vegetation control, including thatch buildup and noxious weeds; monitoring of threats and population levels in detail sufficient to quantitatively assess population trends; maintaining hydrological functions; and outreach to neighboring landowners. Management plans should take an ecosystem approach to management by ensuring the long-term maintenance of wetland and adjacent upland plant associates.
- Additional *Lomatium cookii* occurrences identified through future site assessments, GIS and other analyses, and status surveys that are determined essential to recovery are protected.
- Achievement of self-sustaining *Lomatium cookii* populations will be determined through species monitoring and status surveys in each protected occurrence. Population trends must be shown to be stable, increasing or showing only minor declines from high population levels for 10 years prior to consideration for reclassification.
- Seed collection is accomplished at each core area as insurance against the risk of stochastic extirpations and to ensure that genetic variation can be restored if extirpations occur. Seed banking may also be necessary to complete the reintroductions or introductions required to meet recovery criteria (see Table IV-4).
- Reintroductions and introductions must be carried out as described in Table IV-4. Introductions may replace extirpated occurrences that cannot be restored to the same site as the original occurrence.
- De-listing criteria include:
 - At least 17 of 18 occurrences for *Limnanthes pumila* ssp. *grandiflora*; or 33 of 36 occurrences for *Lomatium cookii* (approximately 95 percent of documented/extant occurrences) should be protected in conservation oriented ownership (i.e., land that is formally secured from habitat loss and degradation by way of conservation easements, formal agreements, conservation banks, or public or conservation group ownership). For occurrences that have become extirpated, reintroduced or introduced populations may be substituted. Introduced or newly discovered

populations outside of currently known core areas may be substituted if the FWS deems them equivalent in their contribution to recovery.

- At least 95 percent of suitable vernal pool habitat acreage within each Priority 1 core area for the species and at least 90 percent of suitable vernal pool habitat acreage within each Priority 2 core area for the species has been protected from development. All suitable habitat must include soils and hydrology that support the plant species.
- Conservation oriented management plans for each protected core area are developed to guide protection and conservation following establishment of protected status such as a conservation easement or transfer of ownership to land trusts or government entities. Each management plan should be operational as soon as possible, as funding and staff time allow.
- Additional species occurrences identified through future site assessments, GIS, other analyses, or status surveys, and that are determined essential to recovery, are protected.
- Status surveys, 5-year status reviews, and population monitoring show achievement of self-sustaining species populations as confirmed through species monitoring and status surveys in each protected occurrence.
- Seeds from each core area of the two species are in storage as insurance against the risk of extirpations and to ensure that genetic lines are preserved. Seed banking is also necessary to complete the reintroductions or introductions that can contribute to meeting recovery criteria.

3. Description of the species range

- The distribution of *Lomatium cookii* ranges from the Agate Desert area of the Rogue Valley in Jackson County to the Illinois Valley in Josephine County [Oregon] (Recovery Plan).
 - Figure A1-1 depicts the current FWS species range (last updated Feb. 2, 2022).
 - The species range is approximately 81,000 acres.

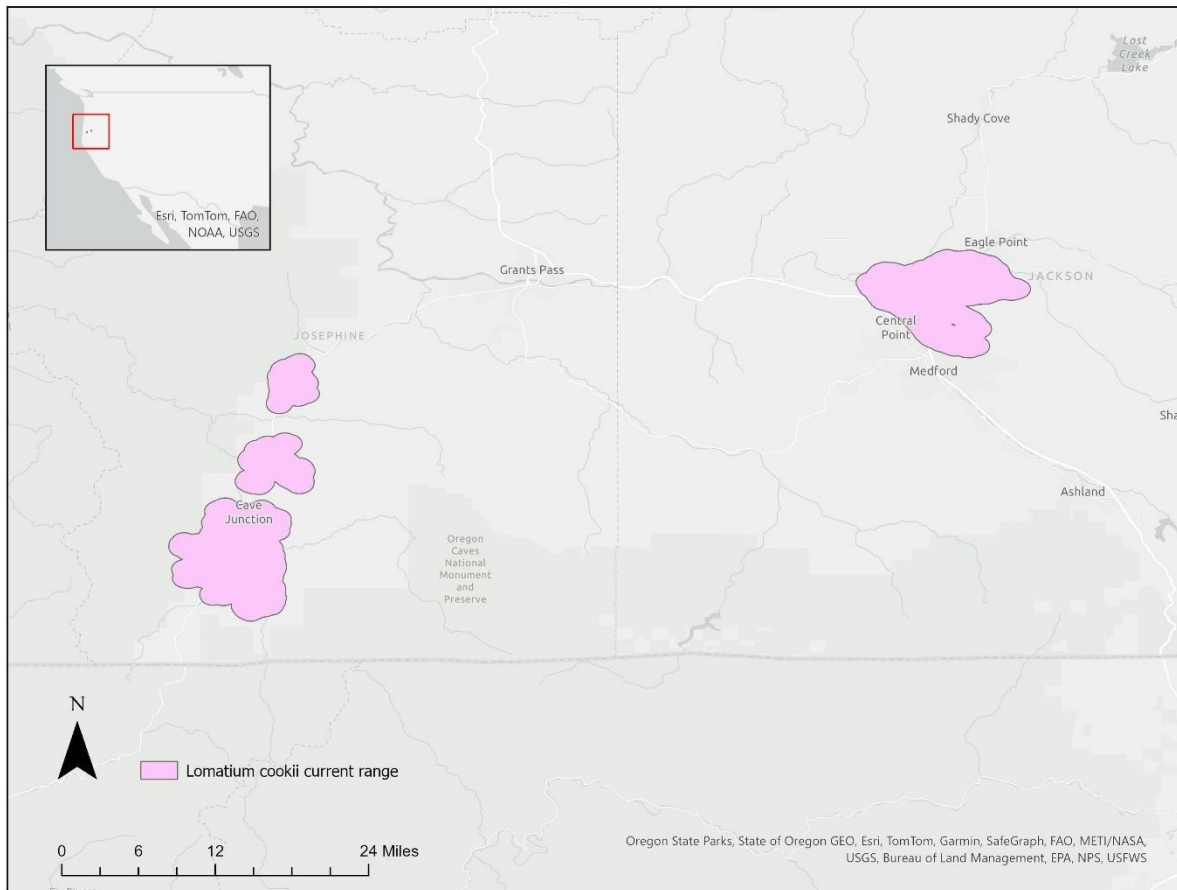


Figure A1-1. FWS Range of the Cook's lomatium.

4. Critical Habitat (Source: 2024 Five Year Review)

- The Cook's lomatium critical habitat designation was revised in 2010 to 1,787 protected acres.
- However, according to the Five Year review, conservation efforts have increased the habitat by 73% from 2002 to 2023. Protected habitat is now 2,576 acres (2024 Five Year Review).
- **Figure A1-2** depicts the current critical habitat.

Cook's Lomatium

- Extant (Blue triangle)
- Extirpated (Yellow circle)
- Unknown (Red square)
- Lomatium cookii core areas (Green outline)

Reference Scale: 1:63,527

August 2024

Figure 2. Cook's lomatum populations in the Illinois Valley, Josephine County, Oregon (USFWS 2024).

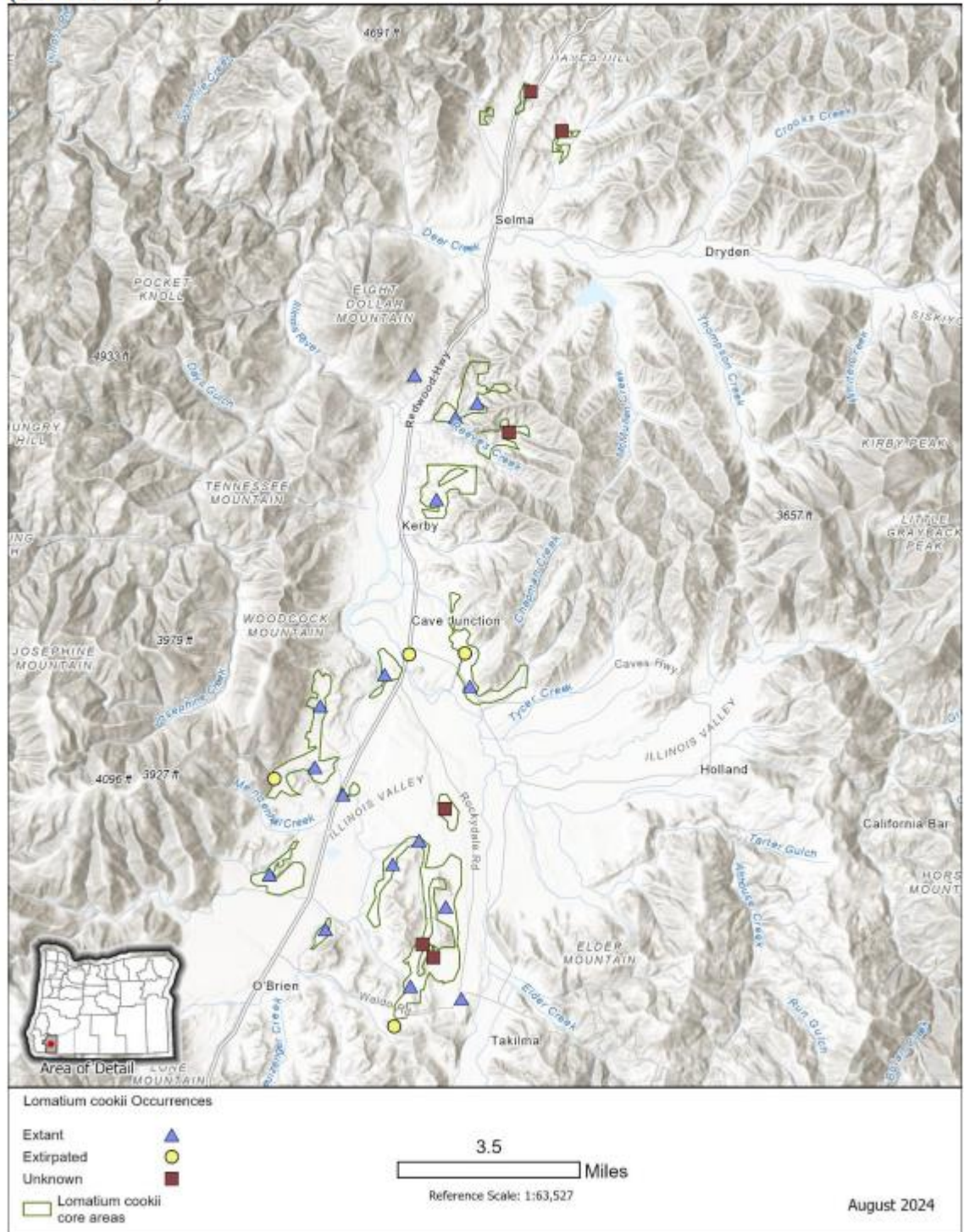


Figure A1-3. Known locations of the Cook's lomatum. Reproduced from FWS 5-year review (2024).

- **Occurrences in iNaturalist**
 - Searched on July 16, 2025
 - https://www.inaturalist.org/observations?subview=map&taxon_id=164722
 - There are 30 research grade observations available from 2019-2024.
- **Occurrences in NatureServe**
 - NatureServe was searched on July 16, 2025
 - https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.133801/Lomatium_cookii
 - NatureServe has 32 documented occurrences in Jackson and Josephine counties in southwest Oregon
 - These locations are generally consistent with the location of the range and critical habitat
- **Occurrences in GBIF**
 - GBIF was searched on July 15, 2025
 - There were 27 “human observations” available for this species.
 - All observations were included in either iNaturalist or NatureServe.
 - [https://www.gbif.org/occurrence/search?offset=0&basis_of_record=HUMAN OBSERVATION&taxon_key=4221235](https://www.gbif.org/occurrence/search?offset=0&basis_of_record=HUMAN_OBSERVATION&taxon_key=4221235)

Collectively, the known location information supports expanding the core map outside of the critical habitat. EPA used known locations described by FWS together with designated critical habitat to create the interim core map.

Appendix 2. GIS Data Review and Method to Develop Core Map (Step 3)

This core map was created based on biological information, including occupied location and critical habitat. EPA used the FWS critical habitat as the starting point for developing this core map. Known locations from the FWS Five-Year Review that occurred outside of the critical habitat were manually added to the core map.

1. Dataset References and Software

- FWS Critical Habitat Shapefile –last updated July 21, 2010
- Software used: ArcGIS Pro 3.3
- FWS Known Occurrences (2024 Five-Year Review)

2. Datasets Used in Core Map Development

All datasets used in core map development are described in EPA’s process document.

3. Core Map Development

- EPA started with the critical habitat established by FWS in 2010. Upon review of the 2024 FWS Five-Year Plan, it was noted that there were a few known Cook’s lomatium occurrences (either extant or status unknown) outside of the critical habitat, but still within the species range.
- This core map contains the area of the established critical habitat in addition to the known occurrences from FWS. EPA used the map in the Five-Year Plan as a reference and created a polygon in the approximate location of the outside known occurrences using the “draw polygon” tool.