

5-Year Review
Short Form Summary
Species Reviewed: *Limnanthes floccosa* ssp. *grandiflora*
(Large-flowered woolly meadowfoam)
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 Reviewer(s):

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

Methodology used to complete the review:

This 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 (USFWS 2010). The primary sources of information used in the review were recent survey information (USFWS 2009) 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). This document was then reviewed by the Oregon Fish and Wildlife Office Recovery Program Leader before submission to the Field Supervisor for approval.

Background:

Limnanthes floccosa ssp. *grandiflora* 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 for Listed Species of the Rogue Valley Vernal Pool and Illinois Valley Wet Meadow Ecosystems 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 *L. f.* 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 5,840 acres of critical habitat for *L. f.* ssp. *grandiflora* published on July 21, 2010 (USFWS 2010). For additional information regarding the species listing history, ecology, and threats, 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 proposed and final critical habitat designation for *Limnanthes floccosa* ssp. *grandiflora* published in the

Federal Register on July 28, 2009 and July 21, 2010 respectively (USFWS 2009, 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 *L. f. ssp. grandiflora*.

Limnanthes floccosa ssp. grandiflora is an annual forb that tends to form dense clusters of individuals (e.g. 1,000 plants per 0.25 acre) in suitable habitat; or can be very sparse (e.g. 5 plants per acre) in less favorable habitat (USFWS 2009). *L. f. ssp. grandiflora* occupies vernal pool habitat in the Rogue River Valley, Jackson County, Oregon, within elevation ranges between 1,220 to 1,540 feet (Huddleston 2001; USGS 2002; USFWS 2010).

At the time of listing, in 2002, there were 15 known occurrences of *Limnanthes floccosa ssp. grandiflora*. At the time of the release of the Draft Recovery Plan in 2006, 22 occurrences were known of *L. f. grandiflora*. Currently, 23 occurrences are known. Portions of 12 occur on public lands, on conservation easements, or on lands managed by The Nature Conservancy (TNC) (Table 1) (USFWS 2009) and thus are protected from development.

Compatible land uses associated with *Limnanthes floccosa ssp. grandiflora* survival appear to be mainly areas managed specifically for conservation. Actions complementary to functioning and stable populations may include prescribed burns, controlled grazing practices (including long-term rest), or regular mowing (USFWS 2010). For example, the periodic burning conducted at TNC's Agate Desert Preserve appears to maintain or increase the site's *L. f. grandiflora* population. The annual mowing performed at the Jackson County School District #9 mitigation site appears sufficient to maintain the third largest population of *L. f. grandiflora* in its range, a population averaging over 20,000 plants. The single largest *L. f. grandiflora* population in its range occurs at the Rogue Plains Preserve Conservation Easement where controlled grazing practices are beneficial and closely monitored by TNC.

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 *Limnanthes floccosa ssp. grandiflora* include habitat or population loss due to development - through present or threatened destruction, modification or curtailment of habitat or range. Aggregate and mineral mining; agricultural development (including leveling, ditching, tilling, and stock pond construction or water impoundments); uncontrolled grazing practices; road construction and maintenance; and recreation such as off-road vehicle (ORV) use, comprise these threats (USFWS 2002; USFWS 2010).

Factor A habitat impacts to suitable *Limnanthes floccosa* ssp. *grandiflora* habitat resulting from residential, urban, agricultural, industrial, and commercial development between 1940 to present, has resulted in over a 60 percent loss of the vernal pool landscape due to building construction, removal of habitat, altered hydrology, or altered topography (ONHP 1997; Wille and Petersen 2006).

Ground-disturbing activities can damage the clay pan layer and allow soil moisture to drain from the vernal pools or wet meadow habitats that the plants depend on for reproduction and survival. Road construction can fragment populations, alter hydrology, or cover plants with fill material, resulting in degradation of habitat and direct loss of plants (USFWS 2010).

Vandalism in the form of damage resulting from unauthorized ORV use has resulted in negative effects on the surface hydrology of the habitat for *Limnanthes floccosa* ssp. *grandiflora*. For example, alteration of the surface hydrology can result in the lack of adequate moisture availability for otherwise suitable habitat.

The effect of grazing practices on suitable habitat depends on how the grazing is managed. There is information showing that certain grazing practices can both positively and negatively impact native plant species' richness (Borgias 2004, Marty 2005). Marty's (2005) study indicates that wet season grazing resulted in a decrease of native forb species at vernal pool edge habitat, the habitat typically occupied by *Limnanthes floccosa* ssp. *grandiflora*. However; the study does mention that year-round grazing was shown to increase species' richness and native plant cover in this edge habitat. Borgias's 2004 study showed that four of five controlled grazing study areas met *L. f.* ssp. *grandiflora* occupancy goals, while only two of six free grazing study areas met occupancy goals for the species. Controlled grazing can benefit *L. f.* ssp. *grandiflora* habitat goals.

Limnanthes floccosa ssp. *grandiflora* is also threatened by encroachment of nonnative plants and small population size (Factor E). Nonnative plants that can outcompete *L. f.* ssp. *grandiflora* 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). In addition the influx of native shrubs could also threaten *L. f.* ssp. *grandiflora*.

Since the time of listing there is a lack of evidence that overutilization (Factor B) or disease or predation (Factor C) are significant threats to the species. Federally or state listed plants are protected on federally-owned property and non-federal publicly-owned property. The Act gives federally listed plants protection from intentional harm on private lands. 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 recovery criteria (Table 1). Nearly 300 acres of occupied *Limnanthes floccosa* ssp. *grandiflora* has been added to the existing 1,175 acres of protected habitat. Management has been implemented on approximately 250 acres to benefit the species while reducing threats at two secured habitats including the Oregon Department of Fish and Wildlife's Denman Wildlife Area and the Oregon Department of Transportation's new Vernal Pool Conservation/Mitigation Bank species (Table 1). Preliminary monitoring data at some of the secured habitats shows that *Limnanthes f.* ssp. *g.* occurrences are relatively stable. No recovery implementation team has been established.

Recovery:

The Draft Recovery Plan (USFWS 2006) recommends the following reclassification criteria for *Limnanthes floccosa* ssp. *grandiflora*:

1. At least 95 percent of suitable vernal pool habitat acreage (as of 2005) within six *Limnanthes floccosa* ssp. *grandiflora* Priority 1 core areas is protected from development and covered under a management plan. Also, at least 85 percent of suitable vernal pool habitat acreage within three Priority 2 core areas is protected.
2. Management plans in each area are approved and being implemented effectively.
3. Ten consecutive years of monitoring indicates population levels are stabilized or increased from baseline conditions.

To safeguard existing genetic material more than 5,600 *Limnanthes floccosa* ssp. *grandiflora* seeds are in storage at the Rae Selling Berry Seed Bank (Guerrant, pers. comm. 2008). The Oregon Fish and Wildlife Office has also developed a 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 for existing occurrences on private lands
- Assist Jackson County School District #9 with meadowfoam habitat management
- Augment *Limnanthes floccosa* ssp. *grandiflora* on protected habitat in the North Eagle Point core area
- Conduct grazing management studies for *Limnanthes floccosa* ssp. *grandiflora*

- Conduct noxious weed control management studies and implement successful weed treatments on *Limnanthes floccosa* ssp. *grandiflora* habitat

Table 1. Status of *Limnanthes floccosa* ssp. *grandiflora* from listing to 5 year review (USFWS. 5-Year Review Short Form Summary Species Reviewed: *Limnanthes floccosa* ssp. *grandiflora* (Large-flowered woolly meadowfoam))

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	1,175	15
2006 (Draft Recovery Plan)	4 partially	No	1,345	22
2010 (critical habitat/5- year review)	5 partially	No	1,470	23

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.

Huddleston, R. 2001. Native Prairie Restoration of The Nature Conservancy’s Agate Desert Preserve in Southwest Oregon. Masters Thesis. University of California, Davis, California.

Marty, J. 2005. Effects of cattle grazing on diversity in ephemeral wetlands. *Conservation Biology* 19:1626-1632.

Oregon Natural Heritage Information Center (ONHIC). 2008. Database for Rare, threatened and endangered species in Oregon. Oregon Natural Heritage Program, Portland, Oregon.

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.

- U.S. Fish and Wildlife Service (USFWS). 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.
- U. S. Geological Survey (USGS). 2002. USGS 30 Meter Digital Elevation Models, 1:24,000. Jackson County Smartmap GIS Services. Available online at < http://www.smartmap.org/Files/Downloads/Datasets_Software/CONTOUR40.zip >. Accessed April 1, 2009.
- 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

- Guerrant, E. 2008. Berry Botanic Garden. Portland, Oregon.
- Friedman, S. 2009. USFWS, Roseburg Field Office, Roseburg, Oregon

Appendix A. *Limnanthes floccosa* ssp. *grandiflora* Action Plan

Responsible office: Roseburg Field Office // Area: Jackson County, Oregon																	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 large-flowered woolly meadowfoam populations	Develop easements on existing populations on private lands	OR	1	FWS, land trusts, private	40 Bio Hrs or \$30,000	\$0	40 Bio Hrs or \$30,000	40 Bio Hrs or \$5,000	\$0	40 Bio Hrs or \$5,000	40 Bio Hrs or \$5,000	\$0	40 Bio Hrs or \$5,000	40 Bio Hrs or \$5,000	\$0	40 Bio Hrs or \$5,000	40 Bio Hrs	\$0	40 Bio Hrs
		Assist Jackson County School District #9 with meadowfoam habitat restoration	OR	2	FWS, COUNTY	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000	80 Bio Hrs	\$0	80 Bio Hrs	80 Bio Hrs	\$0	80 Bio Hrs
		Assist the Bureau of Reclamation with meadowfoam habitat restoration	OR	3	FWS, BOR	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000
		Assist the Denman Wildlife Area with meadowfoam habitat restoration	OR	4	FWS, ODFW	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000
		Assist ODOT with meadowfoam habitat protection and restoration	OR	5	FWS, ODOT	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000
		Assist Jackson County Parks with meadowfoam 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 meadowfoam habitat restoration	OR	7	FWS, ODA, TNC, ODFW	\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000				\$5,000	\$0	\$5,000
2	Re-introduction and augmentation to enhance population viability	Collect seed from populations throughout range	OR	12	FWS, ODA, ODOT, Berry, TNC, BOR, private				\$2,000	\$0	\$2,000	\$2,000	\$0	\$2,000					\$2,000	\$2,000
		Augment meadowfoam on protected habitat in the North Eagle Point core area	OR	8	FWS, ODA	\$10,000	\$0	\$10,000	\$10,000	\$0	\$10,000									
		Reintroduce meadowfoam to protected suitable habitat at the Rogue Airfield core area	OR	9	FWS, ODA, County				\$10,000	\$0	\$10,000	\$10,000	\$0	\$10,000						
		Augment the meadowfoam population at the Agate Desert core area	OR	10	FWS, ODA, TNC, ODFW	\$10,000	\$0	\$10,000	\$10,000	\$0	\$10,000									
		Augment meadowfoam population in areas in northern Rogue River Valley	OR	11	FWS, ODA, private	\$10,000	\$0	\$10,000	\$10,000	\$0	\$10,000									
3	Conduct research essential to the conservation of the species	Conduct grazing habitat management studies	OR	13	FWS, City, County	\$20,000	\$0	\$20,000	20 Bio Hrs		20 Bio Hrs	\$20,000	\$0	\$20,000						
		Conduct burning habitat management studies	OR	14	FWS, Private, land trust				\$20,000	\$0	\$20,000	\$20,000	\$0	\$20,000	20 Bio Hrs		20 Bio Hrs			
		Conduct herbicide habitat management studies	OR	15	FWS, BOR, ODA,							\$20,000	\$0	\$20,000	40 Bio Hrs		40 Bio Hrs	40 Bio Hrs	\$0	40 Bio Hrs
		Conduct meadowfoam surveys	OR	16	FWS, ODA, Land trust				40 Bio Hrs or \$5,000	\$0	40 Bio Hrs or \$5,000				40 Bio Hrs or \$5,000	\$0	40 Bio Hrs or \$5,000			

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Limnanthes floccosa* ssp. *grandiflora*
(large-flowered woolly meadowfoam)

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 Thull

Date 9-27-2011