



Conservation Recommendations
for Lime Hill and Mount Wilson
Asotin County, Washington
2014

Prepared for
U.S. Fish and Wildlife Service

Prepared by
Joseph Arnett
August 7, 2014



**Conservation Recommendations
for
Lime Hill and Mount Wilson
Asotin County, Washington**

**Including supplemental information on
Cape Horn and parts of the Asotin and Chief Joseph
Wildlife Areas**

August 7, 2014

Prepared for:

U.S. Fish and Wildlife Service
Western Washington Office
Region 1
Section 6, Segment 83

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by

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Acknowledgments

The Blue Mountains occur in a corner of Washington that was relatively unknown to me when I began studying the area in 2009, and I am indebted to others who know this landscape well and helped inform and direct my investigation. While any misinterpretations are my own, I first want to thank Curtis Bjork, whose intensive study of the Lime Hill area gave me a great introduction to the botany of that place, and who brought the significance of this area to the attention of the Washington Natural Heritage Program. Bob Dice, Asotin manager for Washington Department of Fish and Wildlife, and Ryan Cloud, Department of Natural Resources land managers, provided invaluable information on access and management challenges; Mark Darrach, botanist for the Umatilla National Forest, and Roger Ferriell, botanist for the Vale District of the Bureau of Land Management, added the botanical perspective and pointed to areas of special interest; Joan Frazee, Forest botanist for the Umatilla National Forest linked me up with Washington Department of Fish and Wildlife and Conservation District assessment of Blue Mountains grasslands. Richard Fleenor, of the Natural Resources Conservation Service, survived a trudge up Green Gulch.

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Introduction

The Blue Mountains of Washington are of great botanical interest; extensive grasslands occur on the steep canyon slopes, particularly of the Snake River and its tributaries, and the rugged terrain has protected rare plant species lost to agriculture in the more accessible Palouse Prairie (used here broadly to include the deep-soiled grasslands extending south of the Snake River).

Additionally, many species more common to the south spill over into Washington only in the Blue Mountains, where they are rare from a state-wide perspective. The relatively isolated Blue Mountains also provide habitat for an assemblage of endemic species, including some that are rare. The scope of this report will be limited to vascular plants, although the same characteristics of these grasslands may also provide uncommon habitat for lichens, bryophytes, fungi, plant communities, and animals.

Geographically, this project was limited to grassland habitats in the Blue Mountains Ecoregion. A band of grasslands occurs along the boundary between the Columbia Plateau and Blue Mountains ecoregions, where the topography begins to rise up to the ecotone between the grasslands and the more forested parts of the Blue Mountains. This report is focused primarily on the area between the Grande Ronde River and the Snake River, especially around Lime Hill and Mount Wilson. In order to better understand the distribution and abundance of the rare species in this area, surveys were also conducted in selected areas to the west, including the Shumaker Unit of the Chief Joseph Wildlife Area, the Asotin Creek unit of the Asotin Wildlife Area, and the Cape Horn area. Figure 1 shows a map of the areas in the Blue Mountains that were the focus of this study.

It is possible, even likely, that other portions of the Blue Mountains grasslands will prove to include high levels of biological diversity, including many of the species reported here. Our approach was to begin in the center of known concentrations of rare species and then expand our searches outward, with the objective of identifying the extent of these populations, and to understand the occurrences in the broader context of Blue Mountains grasslands overall.

Even within the areas we studied most closely, our knowledge of the distribution of rare plants remains partial. The completeness of our inventory was limited by the physical effort required to access this steep terrain. We also limited our surveys to public land; these lands are extensive in this portion of Washington, access was easily obtained, and ultimate conservation, if warranted, is more likely in land already in public ownership. It is likely that the species observed on public land also occur on adjacent private land; consequently, a complete inventory of rare plant species and habitat in Blue Mountains grasslands is beyond the scope of this report. However, we offer this work as a summary of existing information and conservation proposals for the areas that appear to warrant greater protection.

The descriptions of species distributions given in Appendix A, and the maps compiled in Appendix B, are included to help inform future botanical inventory, by alerting botanists to species known to occur in the vicinity and likely to be present in other suitable habitat that has not yet been inventoried.

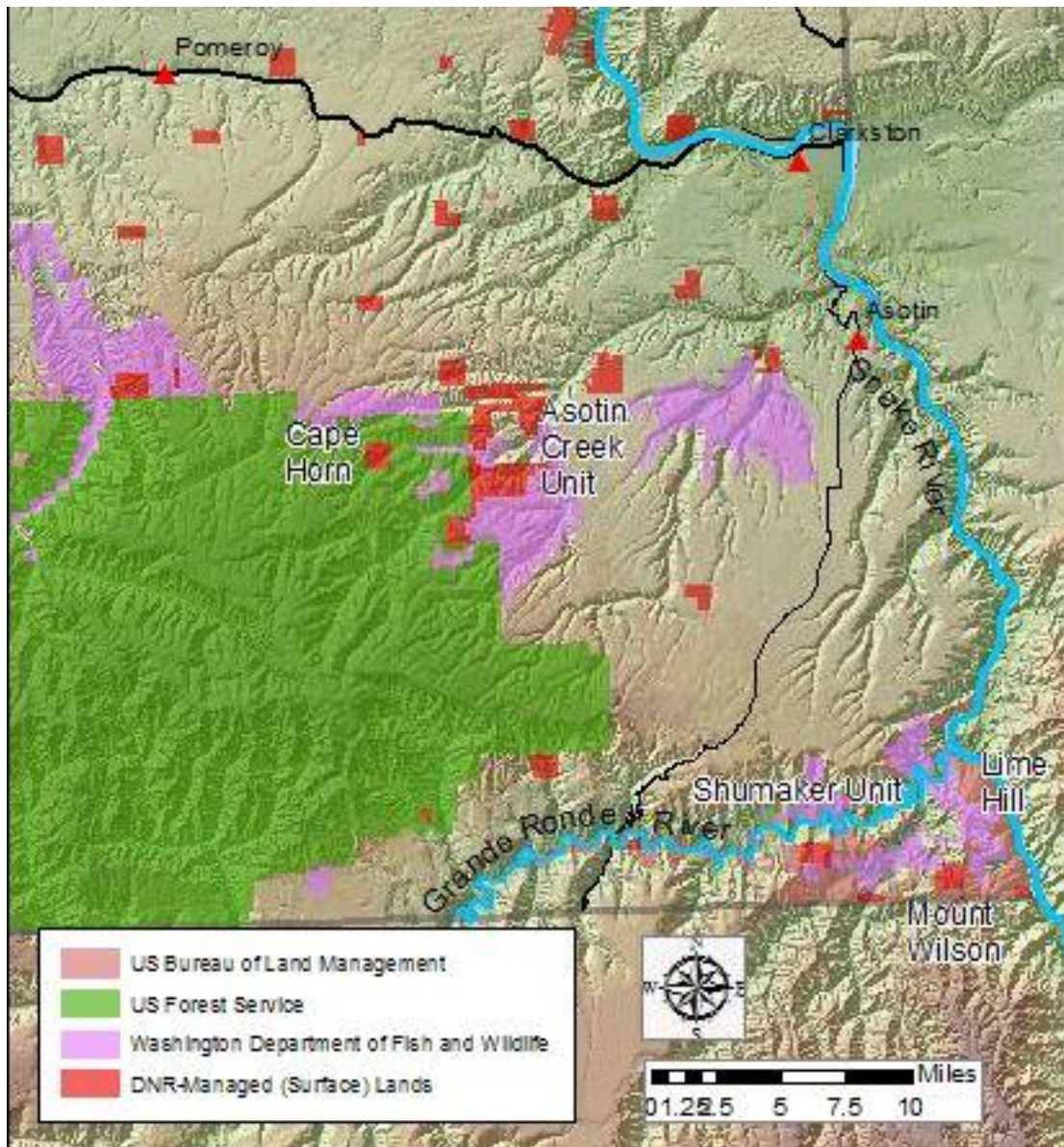


Figure 1. Vicinity map of study areas in the Blue Mountains.

Distribution and Status of Rare Plants in the Blue Mountains

The term “rare plants” is used in this report specifically to refer to vascular plant species that have been designated as endangered, threatened, or sensitive in Washington by the Washington Natural Heritage Program (WNHP). Table 1 presents a list of these species known from Blue Mountains grasslands. In addition to endangered, threatened, and sensitive species, this list includes review species, which are taxa that may potentially be at risk, but for which we have too little information to assign a statewide status. Endangered, threatened, and sensitive species are described in the section that follows. Appendix B includes distribution maps of rare plant species in the Blue Mountains grasslands and notes on the distribution of these species beyond Washington.

Table 1. Rare plant conservation priorities in Blue Mountain Ecoregion grasslands.

Scientific Name	Common Name	State Status	Federal Status
Conservation Priority 1			
<i>Calochortus macrocarpus</i> var. <i>maculosus</i>	sagebrush mariposa-lily	E	
<i>Lupinus sabinianus</i>	Sabin's lupine	E	
<i>Ribes cereum</i> var. <i>colubrinum</i>	wax currant	E	
<i>Rubus nigerrimus</i>	northwest raspberry	E	SC
Conservation Priority 2			
<i>Arabis crucisetosa</i>	cross-haired rockcress	T	
<i>Asclepias cryptoceras</i>	Davis' milkweed	T	
<i>Cheilanthes feei</i>	Fee's lip-fern	T	
<i>Cryptantha rostellata</i>	beaked cryptantha	T	
<i>Diplacus cusickii</i>	Cusick's monkeyflower	T	
<i>Erythranthe patula</i>	stalk-leaved monkeyflower	T	
<i>Hackelia hispida</i> var. <i>hispida</i>	rough stickseed	T	
<i>Lomatium rollinsii</i>	Rollins' desert-parsley	T	
<i>Oenothera caespitosa</i> ssp. <i>marginata</i>	tufted evening-primrose	T	
<i>Petrophytum caespitosum</i> ssp. <i>caespitosum</i>	Rocky Mountain rockmat	T	
<i>Pyrocoma scaberula</i>	Palouse goldenweed	T	
<i>Ribes oxycanthoides</i> var. <i>irriguum</i>	Idaho gooseberry	T	
<i>Silene spaldingii</i>	Spalding's catchfly	T	LT
Conservation Priority 3			
<i>Astragalus arthurii</i>	Arthur's milk-vetch	S	
<i>Astragalus cusickii</i> var. <i>cusickii</i>	Cusick's milk-vetch	S	
<i>Bolandra oregana</i>	Oregon bolandra	S	
<i>Erigeron davisii</i>	Davis' fleabane	S	
<i>Lomatium serpentinum</i>	Snake Canyon desert-parsley	S	
<i>Spartina pectinata</i>	prairie cordgrass	S	
Species Under Review (R1 species have distribution information insufficient for priority assignment; R2 species have taxonomic questions)			
<i>Castilleja applegatei</i>	wavey-leaved paintbrush	R1	
<i>Crepis bakeri</i> ssp. <i>idahoensis</i>	Idaho hawkbeard	R1	
<i>Erigeron disparipilus</i>	Snake River daisy	R1	
<i>Heuchera grossulariifolia</i> var. <i>grossulariifolia</i>	gooseberry-leaved alumroot	R1	
<i>Lupinus lepidus</i> var. <i>cusickii</i>	prairie lupine	R2	SC
<i>Penstemon pennellianus</i>	Blue Mountain penstemon	R1	
<i>Salix monochroma</i>	one-color willow	R1	
<i>Senecio crassulus</i>	thick-leaved groundsel	R1	

Focus Areas in Blue Mountains Grasslands

Figure 2 shows the distribution of rare plant populations in an area extending from Lime Hill to Mount Wilson. Lime Hill includes a limestone formation that lies between the Grande Ronde River and the Snake River, shown in the northeast quarter of this map. Mount Wilson is just north of the border with Oregon in the lower edge of this map. This is the area focused on in this report.

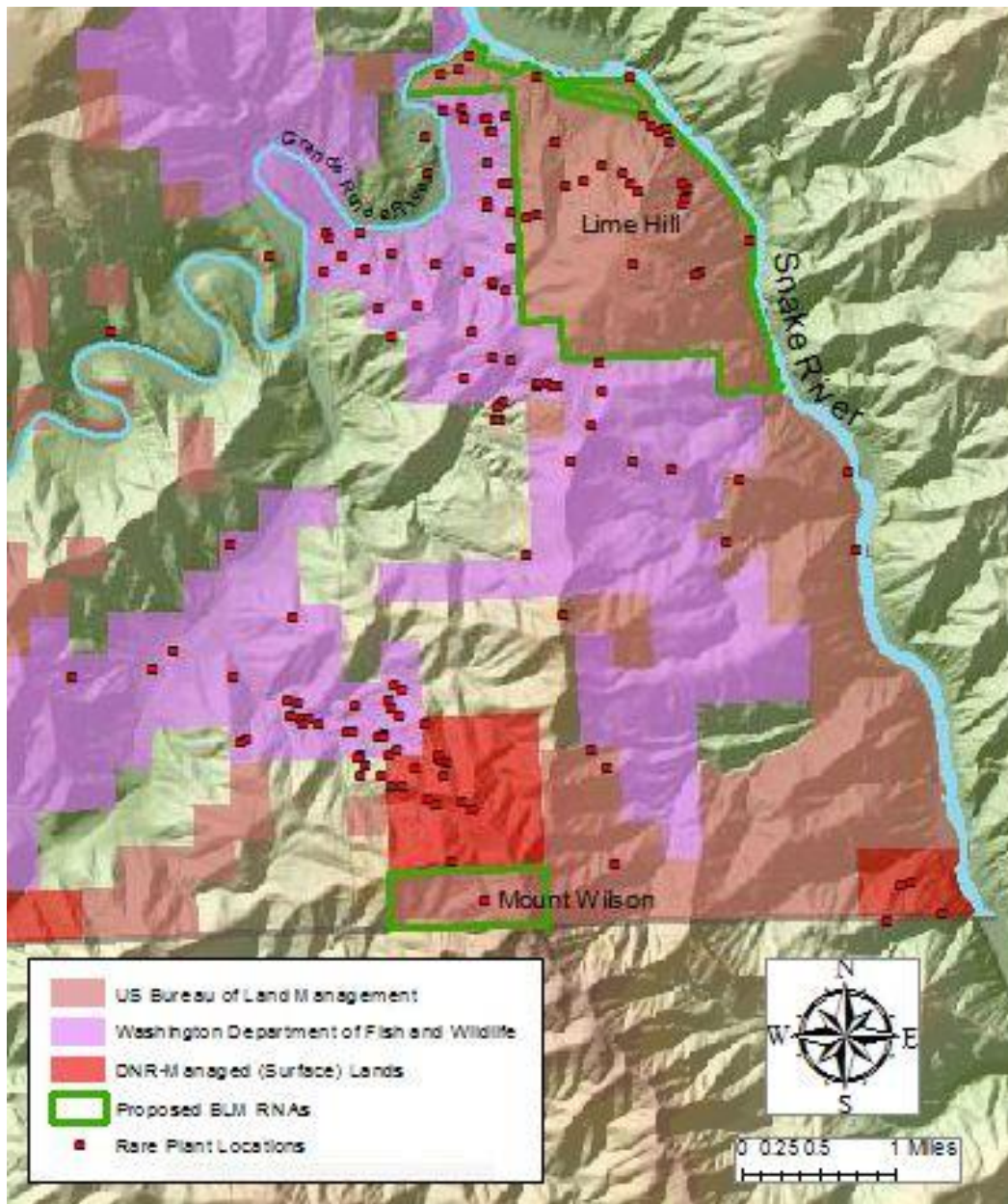


Figure 2. Map of the Lime Hill-Mount Wilson area.

Lime Hill Area

Table 2 lists the rare plant species reported from the vicinity of Lime Hill. The clustering of calcophile plant species around Lime Hill is due to the presence of limestone; this rock formation has been intensively surveyed, and we have a good understanding of the distribution of rare plants in this immediate vicinity. The clustering of occurrences between Green Gulch and Mount Wilson is also well known because of the survey efforts in that area, but it is likely that additional populations will be found in the gaps between these two areas as more fieldwork can be done. The slope between the ridge top and the Snake River is steep and requires a long trek to access it. A thorough inventory of these areas would be very labor intensive.

The Lime Hill area has been known for its diversity of rare plant species since Curtis Bjork and Matt Finer conducted their careful botanical inventory (Bjork & Finer, 2002). They found a suite of calcophiles on the limestone outcrop on the northeast side of Lime Hill, as well numerous other species that are rare in Washington. Especially noteworthy was the discovery here and description by Bjork and Fishbein (2006) of a new species, *Astragalus asotinensis* (Asotin milk-vetch). Extensive surveys have only located this species on the single outcrop of limestone that spans the Snake River near its confluence with the Grande Ronde River (Bjork 2010).

Subsequent surveys by Bjork and the current author have found several of the taxa known from Lime Hill extending south to Mount Wilson and to other areas east along the Grande Ronde River. The calcophiles, including *A. asotinensis*, have only been found on Lime Hill.

In 2013, in the process of revising its Resource Management Plan (RMP), the Bureau of Land Management (BLM) proposed Research Natural Area (RNA) status for areas around Lime Hill and Mount Wilson (see figures 3 and 4). The RMP has not yet been finalized, so at the present time these two RNAs are still “proposed.” In our assessment, the richness of the floral biodiversity in both of these areas suggests that conservation of these sites is warranted, and we support the designation of these two RNAs by the BLM. Furthermore, many of the rare species on the proposed RNAs extend onto adjacent state land, where protection may also be warranted.

Most of the land around Lime Hill adjacent to the BLM property is owned and managed by Washington Department of Fish and Wildlife (WDFW) as part of the Shumaker Unit of the Chief Joseph Wildlife Area. We recommend at a minimum that conservation of rare plant species be included in their management plans. Appropriate management actions would include continuing weed control and potentially limiting cattle grazing. We would also recommend that the area be considered for designation as a Natural Area Preserve.

Table 2. Rare plant species known to occur in the vicinity of Lime Hill.

Species	WA Status	Notes
<i>Arabis crucisetosa</i>	T	The large Lime Hill population is the only known occurrence in WA.
<i>Asclepias cryptoceras</i>	T	Though not in large numbers, this species is not uncommon in the small patches of habitat present.
<i>Astragalus arthuri</i>	S	Abundant in numerous upper elevation areas of Lime Hill.
<i>Astragalus asotinensis</i>	T	Fairly abundant in a limited area; this is the full extent of this species' range in Washington
<i>Astragalus cusickii</i> var. <i>cusickii</i>	S	Abundant in numerous upper elevations of Lime Hill.
<i>Bolandra oregana</i>	S	Two occurrences are known from Lime Hill.
<i>Calochortus macrocarpus</i> var. <i>maculosus</i>	E	One occurrence at Lime Hill; an estimated 50 plants were seen scattered over a large area.
<i>Cheilanthes feei</i>	T	A large population, estimated at 500, at Lime Hill.
<i>Cryptantha rostellata</i>	T	Plants previously identified as <i>C. flaccida</i> from Lime Hill are likely to be <i>C. rostellata</i> .
<i>Diplacus cusickii</i>	T	The occurrence at Lime Hill is the only extant population in Washington.
<i>Erythranthe patula</i>	T	Reported from Lime Hill, Smoothing Iron, and Okanogan County.
<i>Hackelia hispida</i> var. <i>hispida</i>	T	Known from the east slope of Lime Hill and one other site in WA, 12 miles to the west along the Grande Ronde River.
<i>Lomatium rollinsii</i>	T	Widely distributed on Lime Hill and in surrounding areas.
<i>Lomatium serpentinum</i>	S	Fairly abundant along the Snake River on Bureau of Land Management (BLM) land.
<i>Petrophytum caespitosum</i> ssp. <i>caespitosum</i>	T	The single known occurrence in Washington grows on the east side of Lime Hill.
<i>Pyrrocoma scaberula</i>	T	A large population, estimated at over a thousand plants, at Lime Hill.
<i>Ribes cereum</i> var. <i>colubrinum</i>	E	About 20 plants reported in a draw up the side of Lime Hill.
<i>Rubus nigerrimus</i>	E	One plant observed on the east side of Lime Hill
<i>Silene spaldingii</i>		This species has been verbally reported as having been observed in the Lime Hill area, but the precise location is not known.

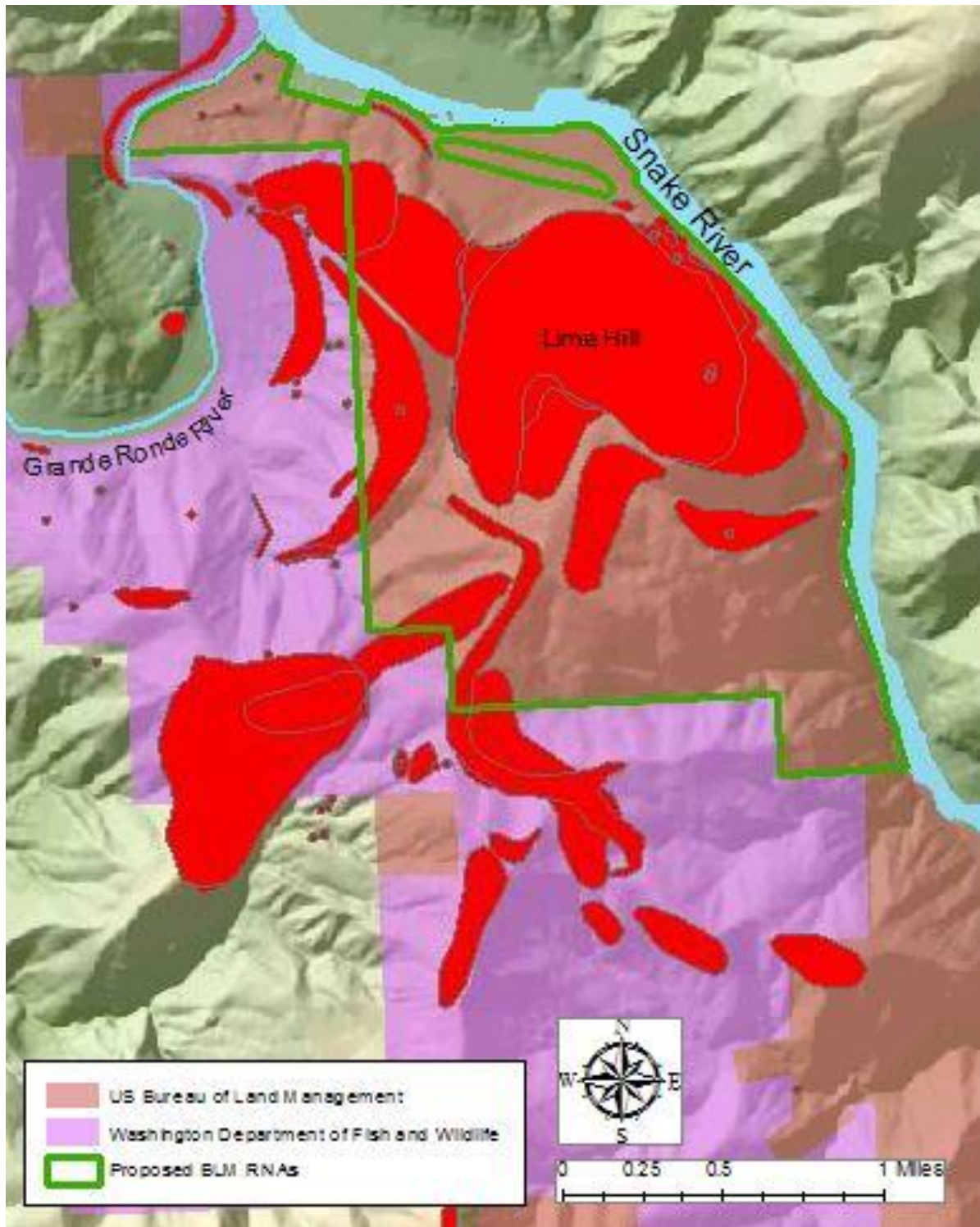


Figure 3. Proposed Lime Hill Research Natural Area.

Conservation Recommendations and Options for the Lime Hill Area

The following recommendations pertain to the areas examined in the course of this study. In all cases, initial communication with the land managing agencies has been made, but ongoing discussion with those agencies is essential to identify and develop appropriate management practices and designations. The WNHP can facilitate these efforts by providing information and expertise regarding the floristic values of the area.

- **Support the BLM proposal to designate Lime Hill as an RNA:** The limestone formation at Lime Hill includes a rich assemblage of rare plant species, as described in Table 2. These species include plants adapted to the more broadly distributed basalt substrate, as well as strict calcophiles. The BLM property at this site includes the limestone outcrop, and the results of this project support the appropriateness of designating this area as an RNA.
- **Evaluate adjacent WDFW land for possible designation as an RNA:** Although the limestone formation appears to be entirely included within the BLM property at Lime Hill, the populations of many species found on BLM land spill over onto WDFW land. Designating a WDFW Natural Area Preserve would complement the proposed BLM RNA. It would provide a buffer to the BLM lands and would provide protection for additional rare plant species. The evaluation process would include additional field work, discussions regarding land management issues, and consideration of potential boundaries.
- **Recommend that WDFW management guidelines for land adjacent to the BLM Lime Hill RNA include conservation of rare plant species:** Whether or not the WDFW decides to assign natural area status to the land adjacent to the BLM Lime Hill RNA, the WDFW management guidelines for that area should recognize the significance of the rare plants present there, and include conservation actions on their behalf.
- **Continue inventory efforts for the rare plant species in this area.**

Mount Wilson Area

Table 3 lists the rare plant species reported from the vicinity of Mount Wilson. The Department of Natural Resources (DNR) section directly south of the proposed Mount Wilson RNA (T6N R46E Section 12), shown in Figure 4, includes populations of *Astragalus arthuri*, *A. cusickii* var. *cusickii*, *Cryptantha rostellata*, and *Calochortus macrocarpus* var. *maculosus*; managing this section with a priority on conservation would add to the conservation value of the proposed Mount Wilson RNA.

Ultimately, designating portions of adjoining state land, both WDFW and DNR, as a Natural Area Preserve is worthy of consideration. Hunting and grazing are two current land uses in the area.

Table 3. Rare plant species known to occur in the vicinity of Mount Wilson.

Species	WA Status	Notes
<i>Asclepias cryptoceras</i>	T	Small populations of this species occur in the upper portions of Green Gulch.
<i>Astragalus arthuri</i>	S	Abundant in numerous areas on the slopes above Green Gulch.
<i>Astragalus cusickii</i> var. <i>cusickii</i>	S	Abundant in numerous areas on the slopes above Green Gulch.
<i>Calochortus macrocarpus</i> var. <i>maculosus</i>	E	Abundant on the slopes above Green Gulch and extending to the upper parts of Mount Wilson.
<i>Cryptantha rostellata</i>	T	This species was observed in six patches on the slopes between Green Gulch and Mount Wilson.
<i>Erigeron davisii</i>	S	The only known occurrence in Washington was reported near the summit of Mount Wilson. It has not been relocated or confirmed with a specimen.

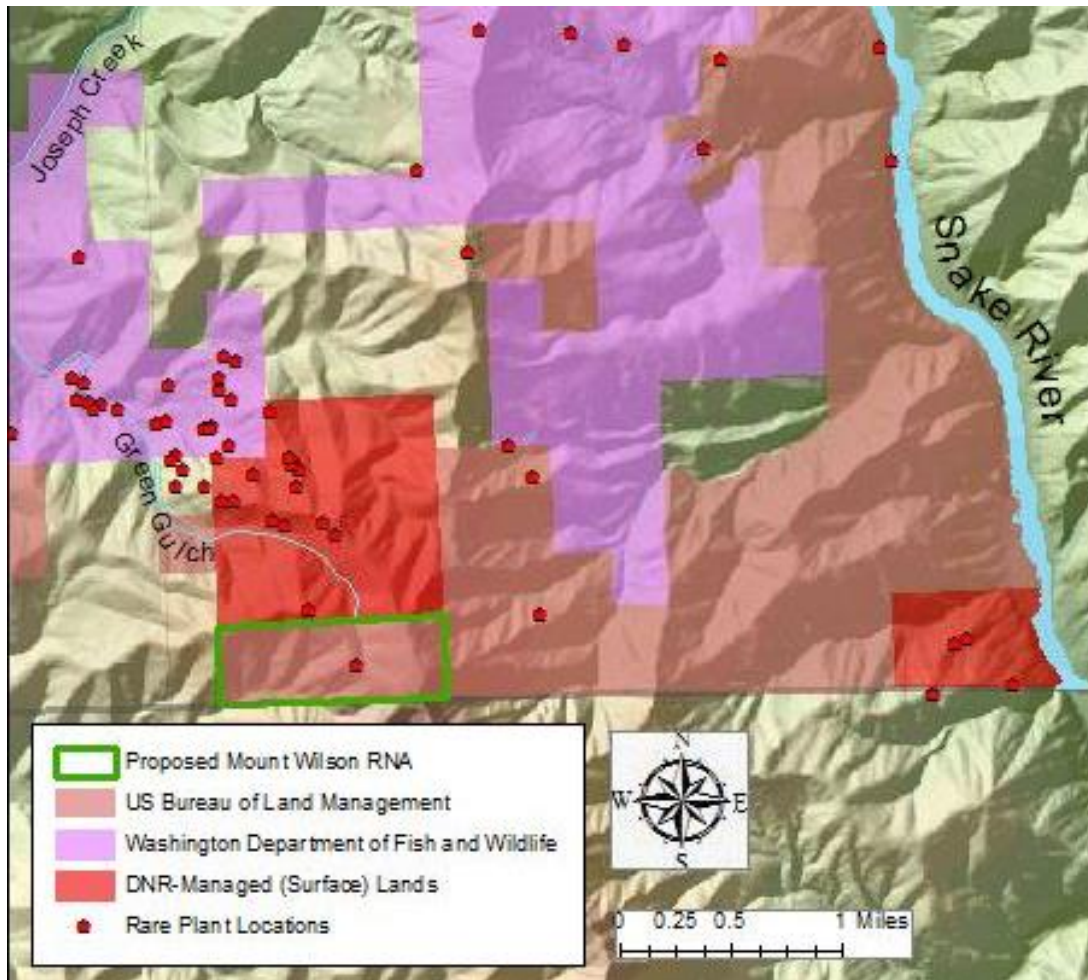


Figure 4. Proposed Mount Wilson Research Natural Area.

Conservation Recommendations and Options for the Mount Wilson Area

- **Support the BLM proposal to designate Mount Wilson as an RNA.** Mount Wilson includes a cluster of rare plant species, as described in Table 3. These species include plants adapted to the basalt substrate that is prevalent throughout the Blue Mountains. The results of this project support the appropriateness of designating this area as an RNA
- **Evaluate adjacent DNR land for possible designation as a Natural Area Preserve or Natural Resources Conservation Area.** Populations of rare species found on BLM land spill over onto DNR land in the section immediately north of Mount Wilson. Natural Area Preserve status would provide a buffer to the BLM property, conserve the adjacent species, and provide secure habitat for other species present there. The evaluation process would include additional field work, discussions regarding land management issues, and consideration of potential boundaries.
- **Recommend that DNR management guidelines for land adjacent to the BLM Mount Wilson RNA include conservation of rare plant species.** Whether or not the DNR decides to assign natural area status to the land adjacent to the BLM Mount Wilson RNA, the DNR management guidelines for that area should recognize the significance of the rare plants present there, and include conservation actions on their behalf.
- **Continue to inventory the rare plant species in this area.** Steep terrain makes careful inventory of this area laborious and time consuming, and much suitable habitat has not been thoroughly surveyed. The two areas that appear to offer particular promise are the east-facing slopes above the Snake River and the north-facing slopes above the Grande Ronde River. This land includes BLM, WDFW, and DNR ownerships.

Supplemental Survey Areas

In order to place the rare plant populations in the Lime Hill to Mount Wilson area in a broader Blue Mountains context, additional surveys were conducted in other selected areas. These are reported below.

Shumaker Grade

A single day of inventory was conducted in the Shumaker Grade Unit of the Chief Joseph Wildlife Area north of the Grande Ronde River, because it was relatively accessible public land in the near vicinity of the Lime Hill-Mount Wilson area. Three rare species were documented on the single ridge that was examined: *Astragalus arthuri*, *A. cusickii*, and *Cryptantha rostellata*. The presence of these species here, in the first outlying area searched, suggests that these species may be quite widespread in this portion of the Grande Ronde River drainage.

Asotin Creek Unit of the Asotin Wildlife Area

Figure 5 shows the distribution of rare plant occurrences in the area extending from the Asotin Creek unit of the Asotin Wildlife Area to Cape Horn. Table 4 lists the rare plant species observed in the Asotin Creek Unit, as well as those observed in the Cape Horn area

Cape Horn Area

A scattering of *Silene spaldingii* plants were observed on Umatilla National Forest land on Cabin Ridge; the number of plants is small compared to the extensive population to the east in Warner Gulch. It is a curiosity that the western-most specimen of this species, shown in Figure 6, was the most vigorous plant of this species that the author has ever observed, with 27 stems, each covered with maturing fruits. *Silene scoulerii* ssp. *hallii*, *Calochortus macrocarpus* var. *maculosus*, and *Senecio crassulus* are also found in this area, and add to its botanical significance. An undescribed phlox species found on Cape Horn is currently being prepared for publication by Carolyn Ferguson, a specialist in the genus, in preparation for inclusion in the Flora of North America (Mark Darrach, Umatilla National Forest botanist, personal communication). Grassland and Ponderosa pine communities in Cape Horn have not yet been evaluated by WNHP ecologists, but they appear to be in exceptionally good condition; these ecosystems include three conservation priorities in the Washington Natural Heritage Plan (WNHP 2014b).

Table 4. Rare plant species known to occur in the Asotin Creek Unit and on Cape Horn.

Species	WA Status	Notes
<i>Astragalus arthuri</i>	S	In several areas on Bracken Ridge and north of Lick Fork Rd.
<i>Calochortus macrocarpus</i> var. <i>maculosus</i>	E	Numerous occurrences, on most ridges with suitable habitat.
<i>Crepis bakeri</i> ssp. <i>idahoensis</i>	S	Occasional in Warner Gulch.
<i>Cryptantha rostellata</i>	T	One occurrence is reported from the George Creek Unit of the Asotin Wildlife area. Because of past confusion with <i>C. flaccida</i> , it may be that <i>C. rostellata</i> is more widespread and abundant in this area than previously reported.
<i>Erythranthe patula</i>	T	Reported from two locations in Warner Gulch.
<i>Lomatium rollinsii</i>	T	Numerous locations in the Asotin Creek and George Creek Units of the Asotin Wildlife Area.
<i>Ribes cereum</i> var. <i>colubrinum</i>	E	Small occurrences in Park Ridge and west of George Creek.
<i>Senecio crassulus</i>	R1	Most occurrences are at higher elevation in the Blue Mountains, but it is known from near Cape Horn.
<i>Silene scouleri</i> ssp. <i>hallii</i>	R1	Many locations on Cabin Ridge and Cape Horn, likely elsewhere in the general area.
<i>Silene spaldingii</i>	T	Numerous occurrences, some very large, in many areas between Park Ridge and Cabin Ridge.

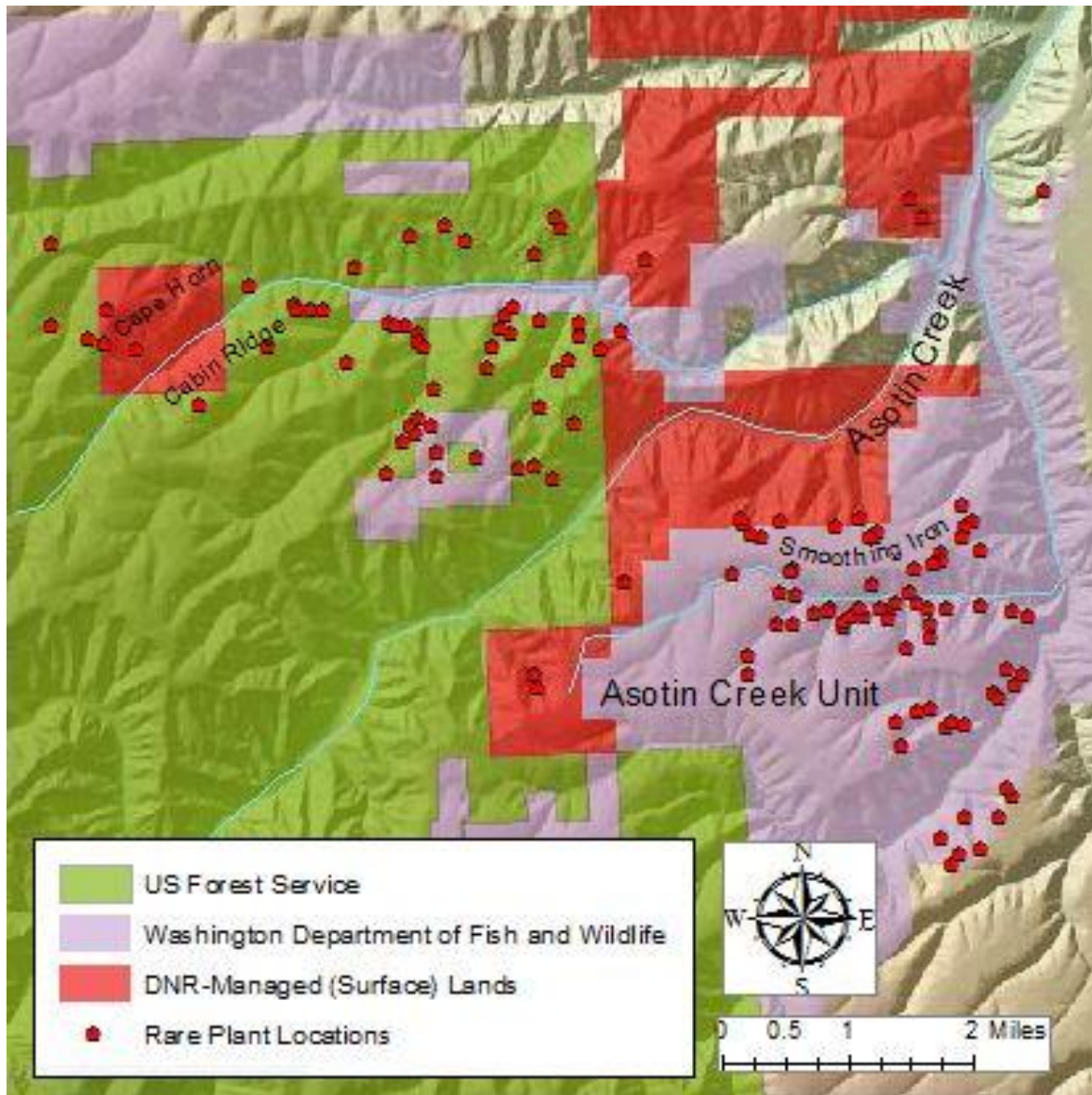


Figure 5. Rare plant occurrences from the Asotin Creek Unit to Cape Horn.



Figure 6. Vigorous example of *Silene spaldingii* from Cabin Ridge.

Summary of Potential Conservation Areas

To date, our review of the Blue Mountains grasslands has indicated the following areas as having the highest botanical significance. These are presented in relative order of significance, based primarily on the presence of priority plant species, according to the WNHP list of endangered, threatened, and sensitive species (WNHP 2014a). We have also considered habitat condition, land ownership patterns, and landscape position. Our knowledge of plant species distribution is certainly biased by the pattern of public land ownership, which is where nearly all inventory work has occurred.

Lime Hill

As our records have suggested for several years, and as Figure 2 and Table 2 illustrate, Lime Hill stands out as supporting a pronounced cluster of rare plants, both those dependent on a calcareous substrate and those more widely distributed on basalt. Detailed information is included in Appendix C and distribution maps are presented in Appendix D. Our knowledge of rare plant distribution strongly supports the proposed designation by the BLM of Lime Hill as an RNA.

Smoothing Iron

The most significant occurrence in the Asotin Wildlife Area and its vicinity is the large population of *Silene spaldingii*, federally listed as threatened under the Endangered Species Act. First reported in 1995, subsequent surveys have shown that this occurrence extends west to Cabin Ridge. Table 4 lists all of the rare or review species documented from this area.

Mount Wilson

Mount Wilson is the high point on the ridge that includes Lime Hill at its northern end. Table 3 lists species reported from Mount Wilson. The proposed Mount Wilson RNA will effectively conserve the species present within the area. The DNR property in Section 12 of T06R46E includes most of the species in Table 4 and would provide a valuable buffer for these species if managed with conservation objectives similar to those in the proposed RNA.

Cape Horn

The species documented in the Cape Horn area include *Silene scouleri* ssp. *hallii*, *Senecio crassulus*, and *Calochortus macrocarpus* var. *maculosus*. The presence of a new *Phlox* species, currently being described, raises our interest in the area. The landscape context of Cape Horn is also distinctive; this ridge is essentially an island of relatively high quality grassland rising above the surrounding forest, including open stands of *Pinus ponderosa*. The area has not been evaluated by the WNHP ecologists, but the priority in the Natural Heritage Plan of related plant communities suggests the area warrants closer scrutiny.

Recommendations of Areas Warranting Additional Inventory

Our knowledge of the distribution of plant species in the area between Lime Hill and Mount Wilson is only partial. In particular, the steep areas between the Snake River and the ridge south of Lime Hill itself have only been partially surveyed, and we expect that additional work, strenuous as it would be, would provide a more thorough understanding of distribution and abundance of species in the area. South of Joseph Creek, on the north facing slopes above the Grande Ronde River, there appears to be extensive habitat for these species, and finding additional populations there would likely effect how we rank these species in Washington.

A summary of DNR land in the study area was prepared as part of our review of this part of Washington, and a table of selected parcels is included in Appendix C to facilitate further review. Likewise, a contact list of agency staff and other individuals that are involved in conservation in one way or another in the Blue Mountains is included in Appendix D.

Although time did not allow a ground survey of other areas in the Grande Ronde River and Joseph Creek watersheds, we were able to observe some areas from the road or slopes across the rivers, and in some cases we were able to note slopes that appeared to be in relatively good condition, on the one hand, or more seriously impacted by weeds on the other. We are not able to provide a systematic analysis, and our observations were selected mostly on the basis of being visible from roads or where we were working on the ground. These notes are presented here to help prioritize inventory work in the future. These observations are limited to public land and are arranged from east to west along the Grande Ronde River.

T6N R46E Section 6. This section, mostly in DNR ownership, appeared to include slopes with vegetation in fairly good condition. Lower slopes, in Section 31 of T7N R46E, are privately owned and appear more weedy in general, though the steeper part in the northwest ¼ looked better.

T7N R45E Section 36 is now owned by WDFW; it appears to have been fairly heavily grazed and is somewhat weedy on both sides of the river.

T7N R44E Sections 34 and 35 (the SW ¼) are owned by BLM and appear to be in good condition.

T6N R44E Section 4 (the NW ¼) south of the river is owned by BLM and appears to be in good condition.

T6N R44E Section 5 (a central parcel south of the river) is owned by BLM and appears to be in good condition.

Other BLM land to the west along the south side of the Grande Ronde River appears more weedy when viewed from the road across the river.

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APPENDIX A: Information on plant species with conservation priority in the Blue Mountains grasslands

The following rare plant species occur within the grasslands of the Blue Mountains.

Arabis crucisetosa

A 1928 collection of this species was reported from “Lime Point”; presumably this referred to the formation now mapped as Limestone Point, directly across the river in Idaho from Lime Hill and part of the same geological formation. Currently this species is known in Washington only from a large population on Lime Hill, and a population in on DNR land in the extreme southeast corner of Washington. Most of the distribution of the species is to the south and east, in Idaho and Oregon.

Asclepias cryptoceras

The known distribution of this species in Washington is limited to the area around Lime Hill and Mount Wilson, but there are numerous small patches of its very specific habitat in the surrounding vicinity, and it is likely present in other areas that have not been closely surveyed. There is also a historical record identified as coming from talus slopes east of Joseph Creek and near the mouth of the Grande Ronde River. Outside of Washington the species is known from the south, in Oregon and Idaho and as far south as Nevada.

Astragalus arthurii

This species is known from numerous occurrences stretching across the eastern part of the Blue Mountains grasslands. These populations mark the northwest extent of the species; beyond Washington, it is distributed more widely in Oregon and Idaho.

Astragalus asotinensis

This species, first described in 2006 (Bjork and Fishbein 2006), is known from a single limestone formation that forms much of Lime Hill and Limestone Point across the Snake River in Idaho.

Astragalus cusickii* var. *cusickii

As we have continued with rare plant inventory in the southeast part of Washington, we have found numerous occurrences of this species, and it has been present in nearly every suitable habitat that we examined. In Washington, this species currently has sensitive status; because of the abundance we are finding, we are planning to review its status in our next cycle of review. To the south, it is abundant along the Idaho-Oregon border, and it also extends east into Idaho.

Bolandra oregana

Most of the distribution of this species is in the mountains of Idaho and Oregon; the northwest part of its distribution just touches the southeast corner of Washington. A disjunct cluster of occurrences is also present 180 miles west, centered in the Skamania County portion of the Columbia Gorge.

Calochortus macrocarpus* var. *maculosus

This species occurs at numerous locations along the eastern edge of the Blue Mountains; it has been found in many areas with suitable habitat surveyed in the Blue Mountains: Lime Hill, Mount Wilson, on nearly all ridge systems from Harlow Ridge to Cape Horn, up above the West Fork of Menatchee Creek, and on the ridge east of Crooked Creek on U.N.F. near the Oregon border. We are planning to review the status of this species in the next cycle of the WNHP rare plant list revision. Outside of Washington there are only a handful of collections in nearby Oregon and Idaho.

Calochortus nitidus

One occurrence of this species has been reported in the Blue Mountains, near Cape Horn. The Forest Service database does not include this record, because Forest Service botanists consider this to have been a false identification. It has been collected three other times in the state, along Route 12 in 1981, in Pullman in 1979, and in 1916 in Oakesville. Its occurrence in the Blue Mountains is not highly likely; for this reason it is not included in Table 2.

Cheilanthes feei

The population at Lime Hill, first reported in 2002, was estimated at 500 clumps, so this is a large population and the only one known to be extant in Washington. It occurs completely within the limestone formation that forms the core of Lime Hill, and completely within BLM ownership. The two other records in Washington are both historical collections from Almota, one from 1964 and one from 1897. Outside of Washington it is known from the Rocky Mountains in B.C., Idaho, Montana, and Wyoming.

Cryptantha rostellata

This species is closely related to *C. flaccida*, and in the recent past it was included within the latter (Jepson Manual, 1993). Several Washington botanists have regarded this lumping as inaccurate, and in the draft of the FNA treatment of this genus, *C. rostellata* is recognized as a distinct well-delineated species. In Washington, our current records show occurrences in two disjunct areas. One is along the western edge of the Columbia Basin in southern Washington, and the other is near the eastern part of the Blue Mountains. It occurs in several locations in the Blue Mountains grasslands that we have examined; specimens will be sent for confirmation to the Ron Kelley, the FNA author for the Boraginaceae and a specialist in this genus and its relatives. It is widespread in Oregon.

Within the Blue Mountains grasslands, WNHP records currently show occurrences near Green Gulch, east of Meyers Creek, and above George Creek. *Cryptantha flaccida* has been reported from other areas; our understanding of the distribution of this species will improve when the taxonomy is better resolved, and we look forward to the coming FNA treatment to facilitate that.

Diplacus cusickii

The occurrence of this species reported at Lime Hill in 1995 is the only known extant occurrence in Washington. In addition to this one there is a historical collection from 1895 from Bingen by Suksdorf. Most of the distribution of the species is to the south, in central Oregon and Idaho.

Erigeron davisii

Curtis Bjork reported this species from near the Oregon border on Mount Wilson, and it remains the only known occurrence in Washington. However, a specimen has not been verified, and searching by Roger Ferriell, BLM botanist, did not relocate the occurrence in 2013. It is found in the Blue Mountains of Oregon and Idaho.

Erythranthe patula

This species has two widely disjunct areas of occupancy in Washington, one in Okanogan County and one in the eastern Blue Mountains. The taxonomy of this group has also been revised several times, and it does not seem unreasonable that there will be genetic differences found between these groups of occurrences. Most occurrences are from the Blue Mountains of Oregon and Idaho.

Hackelia hispida* var. *hispida

This taxon is only known from two areas in Washington: Lime Hill and on the north side of the Grande Ronde River twelve miles to the west. Outside of Washington it is known from the Blue Mountains in Oregon.

Lomatium rollinsii

Generally a canyon grassland species found above many tributaries of the Snake River as well as along the lower elevations of the Blue Mountains. This species is a Blue Mountains endemic known from Washington, Oregon, and Idaho.

Lomatium serpentinum

With the exception of a 1970 collection and a 1964 collection from near Walla Walla, all the known occurrences of this species are along the Snake River. It is fairly abundant near the Snake River on BLM land in the Lime Hill area, and it has been reported upstream along the river as far as the Oregon border. Elsewhere it occurs along the Snake River in Oregon and the Salmon River in Idaho.

Lupinus sabinianus

Only four element occurrences are known to occur in Washington, and three of these are historical collections. One was reported in 1949 just north of Anatone, the others are on the western edge of the Blue Mountains, just east of Walla Walla. The most recent observation was from Biscuit Ridge in 1992. Finding this in either of the study areas is a low probability, but its historical occurrence near Anatone suggests it is a species to look for. Elsewhere it is found in the Blue Mountains in Oregon.

Oenothera cespitosa* ssp. *marginata

This taxon is widespread in Oregon and Idaho; in Washington it is known in the eastern Blue Mountains, from the grasslands along the outer edges up into the mountains.

Petrophytum caespitosum* ssp. *caespitosum

The single known occurrence in Washington grows on the east side of Lime Hill. It is widespread in Idaho, Montana, Nevada, Arizona, Colorado, and Wyoming.

Pyrocoma scaberula

This is a Blue Mountains endemic of Washington, Oregon, and Idaho.

Ribes cereum* var. *colubrinum

Six extant occurrences, all fairly limited in size, are known from Washington; it is reported from Lime Hill, Fisher Gulch, north of Meyers Ridge, west of Highway 129 along the Grande Ronde, from WDFW land on Smoothing Iron Ridge, and on BLM north of Tam Tam Ridge. There is also a curious historical collection from Lions Rock, near Blewett Pass. We would like to examine that collection. A scattering of occurrences is also known from Oregon.

Ribes oxycanthoides* var. *irriguum

Occurrences of this species are scattered along the eastern edge of Washington, almost to the Canadian border. It is also widespread in Idaho, Oregon, and Montana.

Rubus nigerrimus

At least one plant has been reported from Lime Hill, and it has been reported in the lower part of Fisher Gulch. All other known occurrences are from outside of the ecoregion in lower tributaries along the Snake River below Clarkston.

Silene spaldingii

This species is widespread in eastern Washington, in numerous small populations. Several large populations have been found within the past few years in the Blue Mountains grasslands in Washington. The Smoothing Iron occurrence is likely the largest population in the state. Populations are also found in Oregon, Idaho, and Montana.

Spartina pectinata

Very few populations of this species are known from Washington, but they are reported from nearly every corner of the state. In the Blue Mountains it has been reported from along the Grande Ronde and Snake Rivers.

APPENDIX B

Atlas of rare plant distribution in Blue Mountains grasslands

This atlas includes maps showing the known distribution of vascular plant species that occur in Blue Mountains grasslands and that have been assigned conservation status by the Washington Natural Heritage Program. Maps of statewide distribution are also included for species that extend outside of the Blue Mountains ecoregion.

Arabis crucisetosa
Asclepias cryptoceras
Astragalus arthurii
Astragalus asotinensis
Astragalus cusickii var. *cusickii*
Bolandra oregana
Calochortus macrocarpus var. *maculosus*
Cheilanthes feei
Cryptantha rostellata
Diplacus cusickii
Erigeron davisii
Erythranthe patula
Hackelia hispida var. *hispida*
Lomatium rollinsii
Lomatium serpentinum
Lupinus sabinianus
Oenothera cespitosa ssp. *marginata*
Petrophytum caespitosum ssp. *caespitosum*
Pyrrcoma scaberula
Ribes cereum var. *colubrinum*
Ribes oxyacanthoides var. *irriguum*
Rubus nigerrimus
Silene spaldingii
Spartina pectinata

On the maps on the following pages, green diamonds and polygons indicate the known occurrences of the species being presented. BLM ownership is mapped in tan, WDFW in lavender, and DNR in pink. National Forests are typically depicted in green; on a few maps, other federal land, such as National Monuments, is shown in yellow.

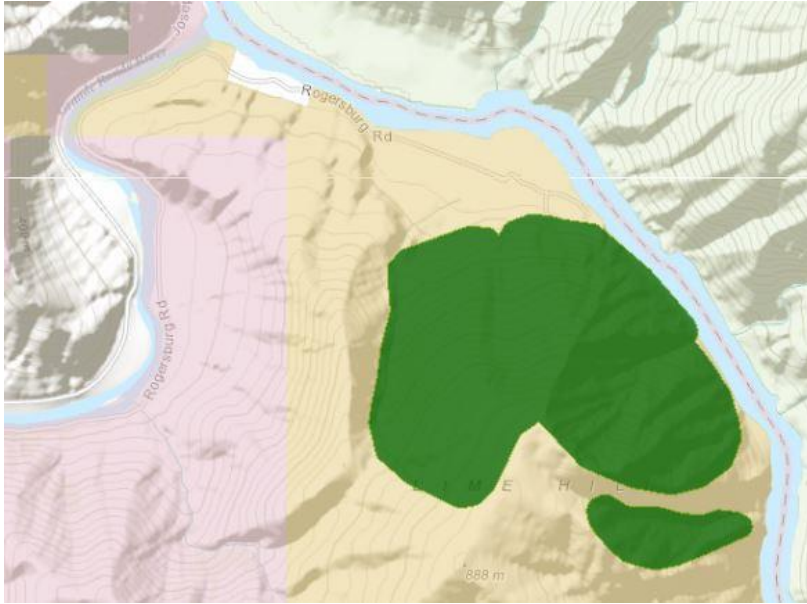


Figure C-1. Distribution of *Arabis crucisetosa* at Lime Hill, the only known occurrence of this species in Washington. A 1928 collection of this species was reported from “Lime Point”; presumably this referred to the formation now mapped as Limestone Point, directly across the river in Idaho from Lime Hill, and part of the same geological formation. Most of the distribution of the species is to the south and east, in Idaho and Oregon.

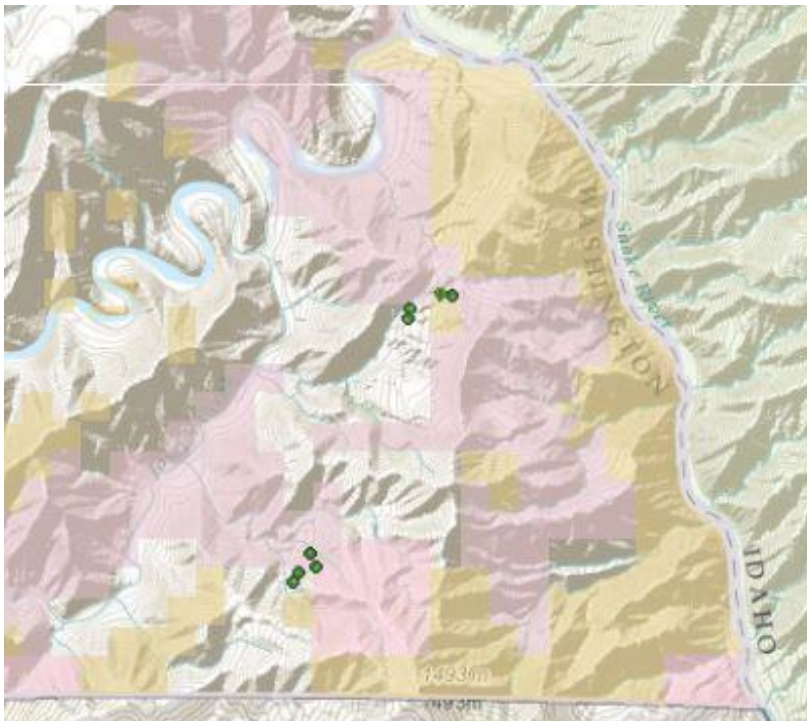


Figure C-2. Distribution of *Asclepias cryptoceras* in Washington. The known distribution of this species is limited to the area around Lime Hill and Mount Wilson; there are numerous small patches of its very specific habitat in this and surrounding area, and it is likely present in other areas. There is also a historical record identified as coming from talus slopes east of Joseph Creek and near the mouth of the Grande Ronde River.

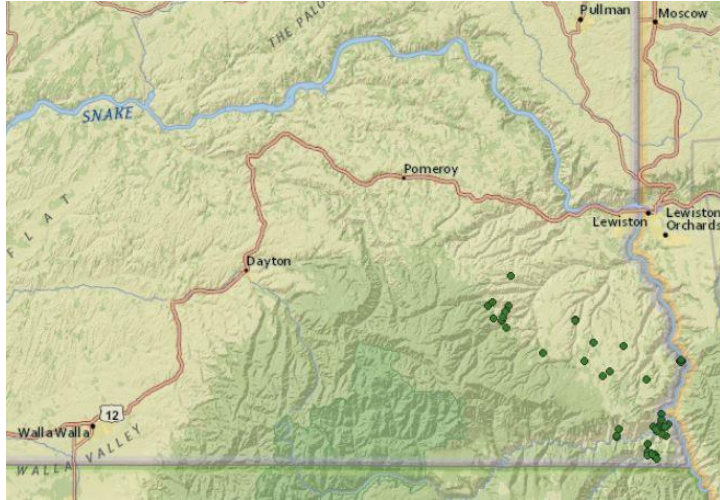


Figure C-3. Distribution of *Astragalus arthurii* in Washington; this species is known from numerous occurrences stretching across the eastern part of the Blue Mountains grasslands. These populations mark the northwest extent of the species; beyond Washington, it is distributed more widely in Oregon and Idaho.

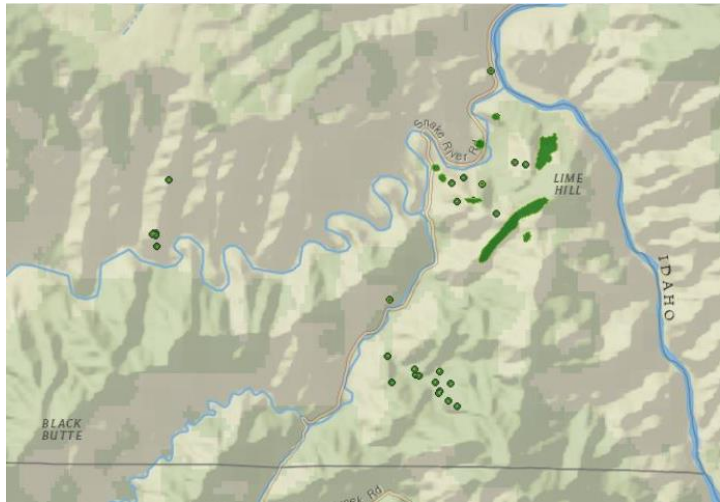


Figure C-4. Distribution of *Astragalus arthurii* in the Lime Hill to Mt. Wilson area.

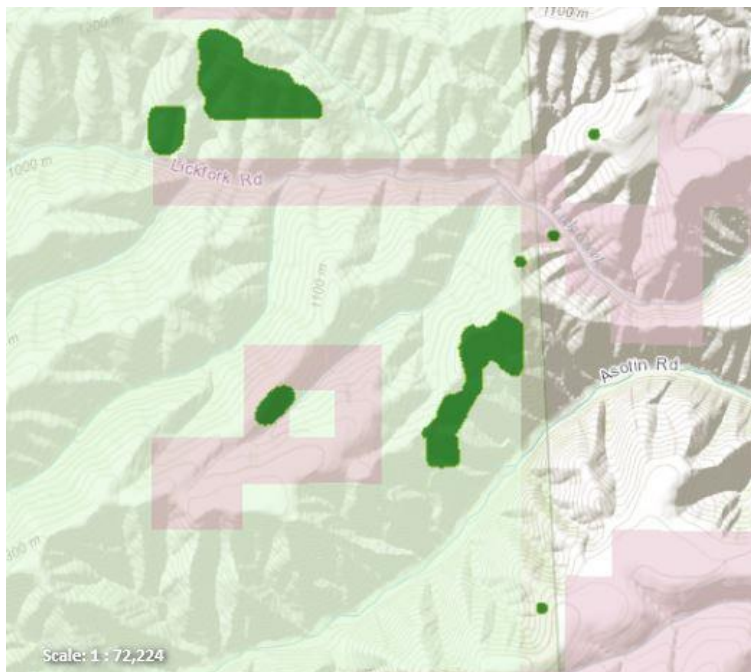


Figure C-5. Distribution of *Astragalus arthurii* in the vicinity of the Asotin Creek Wildlife Area.

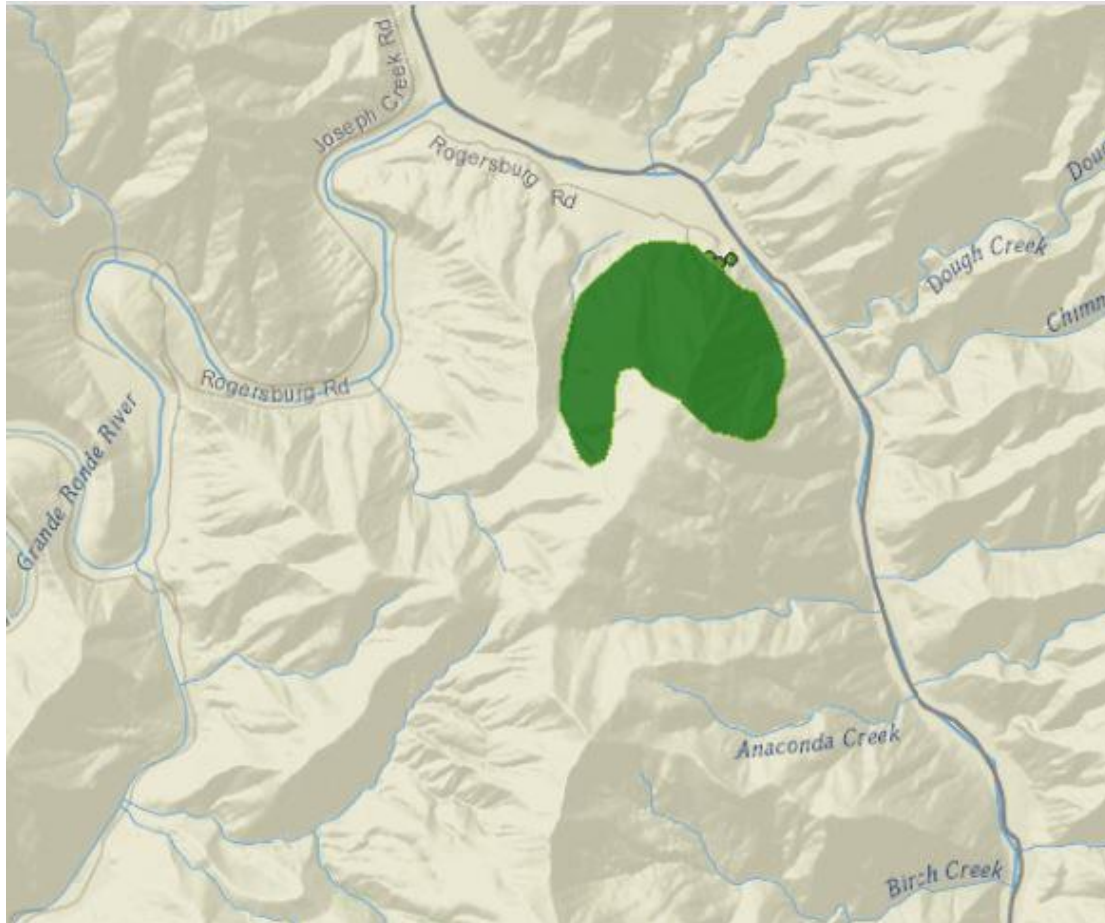


Figure C-6. Distribution of *Astragalus asotinensis* at Lime Hill. This is the known extent of the species in Washington. It also occurs on the same geologic formation on the Idaho side of the Snake River.

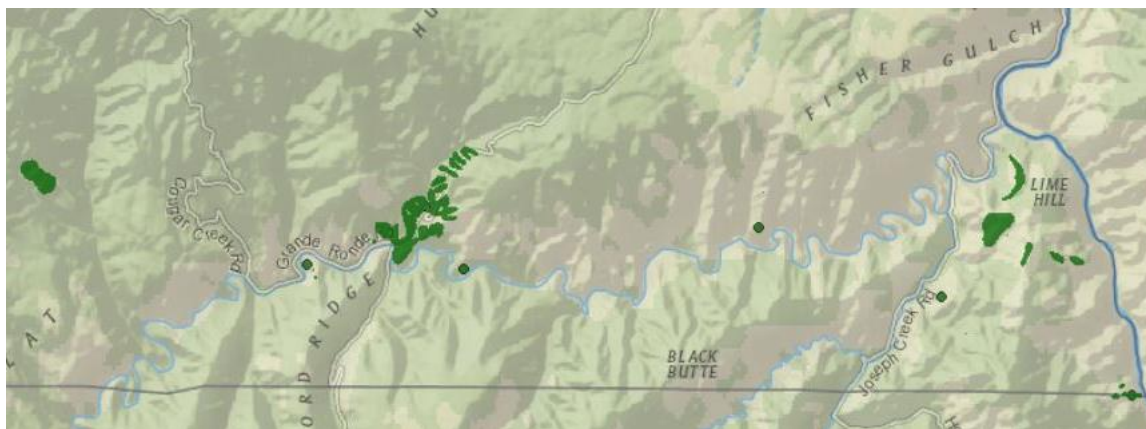


Figure C-7. Distribution of *Astragalus cusickii* var. *cusickii* in the Blue Mountains. This is the extent of the species in Washington. As we continue with inventory in the southeast part of Washington, more and more occurrences of this species are showing up, nearly in every suitable habitat that we look. In Washington this currently has sensitive status on, but we will review it and consider moving it to the Watch List in our next cycle of review. To the south it is abundant along the Idaho-Oregon border, and it also extends east into Idaho.

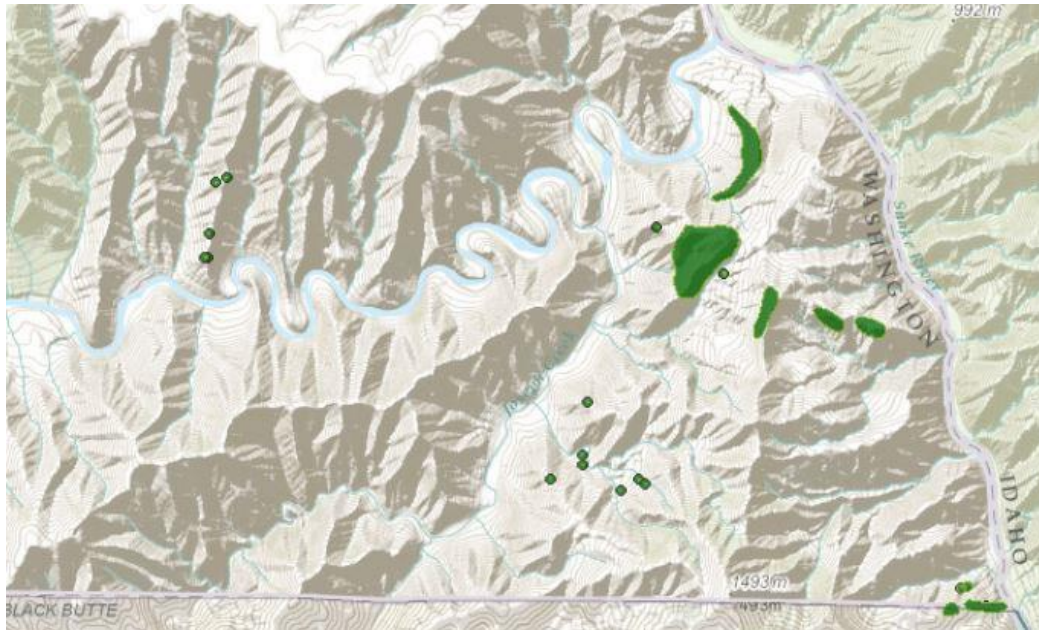


Figure C-8. Distribution of *Astragalus cusickii* var. *cusickii* in the vicinity of Lime Hill and Mount Wilson.

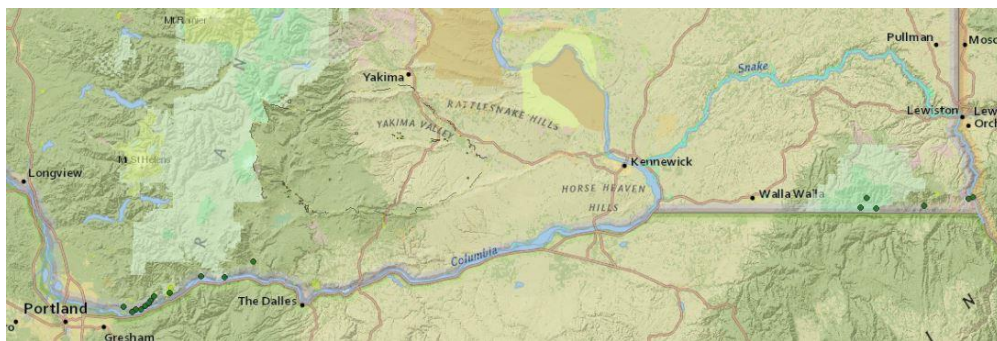


Figure C-9. Distribution of *Bolandra oregana* in Washington. Most of the distribution of this species is in the mountains of Idaho and Oregon, and the northwest part of this part if its distribution just touches the southeast corner of Washington. A disjunct cluster of occurrences is also present 180 miles west of this area, in the Columbia Gorge.

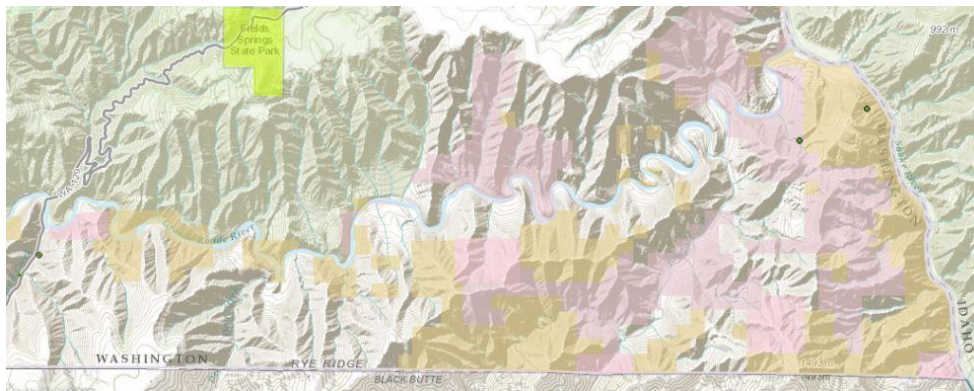


Figure C-10. Distribution of *Bolandra oregana* in Blue Mountains grassland areas south of the Grande Ronde River.

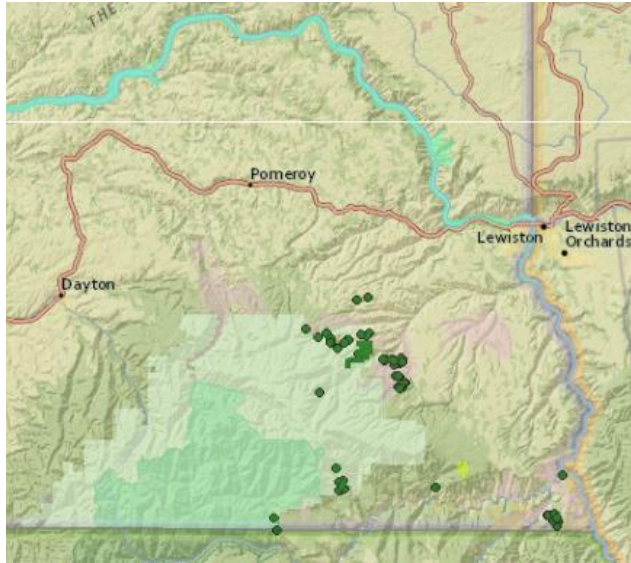


Figure C-11. Distribution of *Calochortus macrocarpus* var. *maculosus* in Washington. This species occurs at numerous locations along the eastern edge of the Blue Mountains; it has been found in nearly all areas with suitable habitat surveyed in the Blue Mountains: on Lime Hill and Mount Wilson, on nearly all ridge systems from Harlow Ridge to Cape Horn, up above the West Fork of Menatchee Creek, and on the ridge east of Crooked Creek on U.N.F. near the Oregon border. We are planning to review the status of this species in the next cycle of the WNHP rare plant list revision. Outside of Washington there are only a handful of collections in nearby Oregon and Idaho.

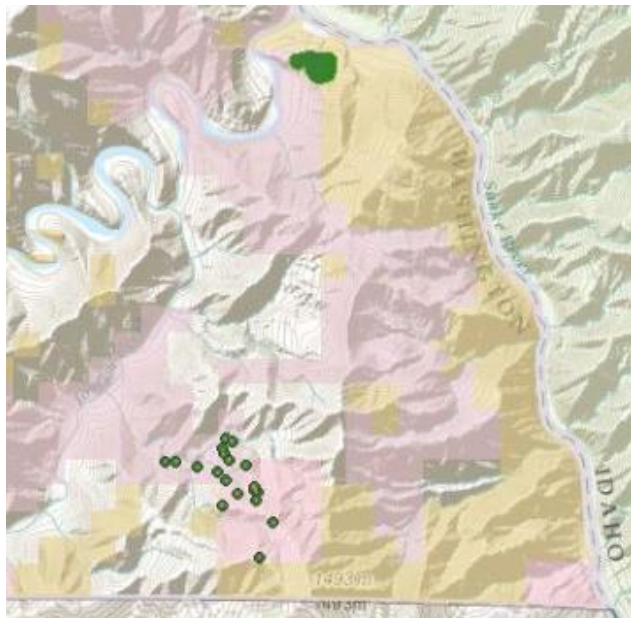


Figure C-12. Distribution of *Calochortus macrocarpus* var. *maculosus* in the Lime Hill and Mount Wilson areas.

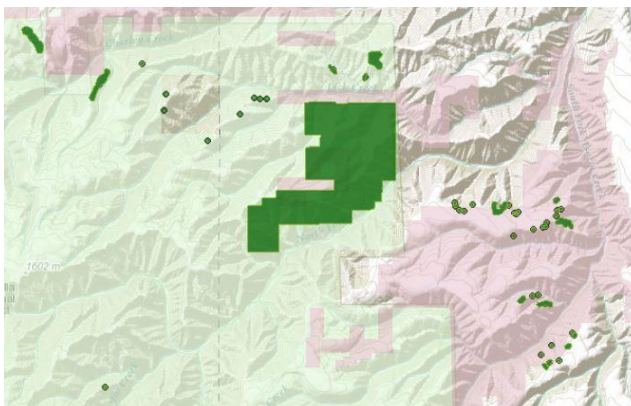


Figure C-13. Distribution of *Calochortus macrocarpus* var. *maculosus* in the Smoothing Iron to Cape Horn areas.



Figure C-12. Distribution of *Calochortus nitidus* in Washington. One occurrence has been reported in the Blue Mountains, near Cape Horn; Forest Service botanists have noted that this may have been a false identification, but this map is included to alert botanists to the report. It has been collected three other times in the state, along Route 12 in 1981, in Pullman in 1979, and in 1916 in Oakesville. Because its occurrence in the Blue Mountains is a remote possibility, it is not included in Table 2.



Figure C-13. Distribution of *Calochortus nitidus* in the Blue Mountains. This occurrence is now in question by the Forest Service.



Figure C-14. Distribution of *Cheilanthes feei* in Washington. The population at Lime Hill, first reported in 2002, was estimated at 500 clumps, so this is a large population and the only one known to be extant in Washington. It occurs completely within the limestone formation and completely within the BLM ownership. The two other records in Washington are both historical collections from Almota, one from 1964 and one from 1897. Outside of Washington it is known from the Rocky Mountains in B.C., Idaho, Montana, and Wyoming.

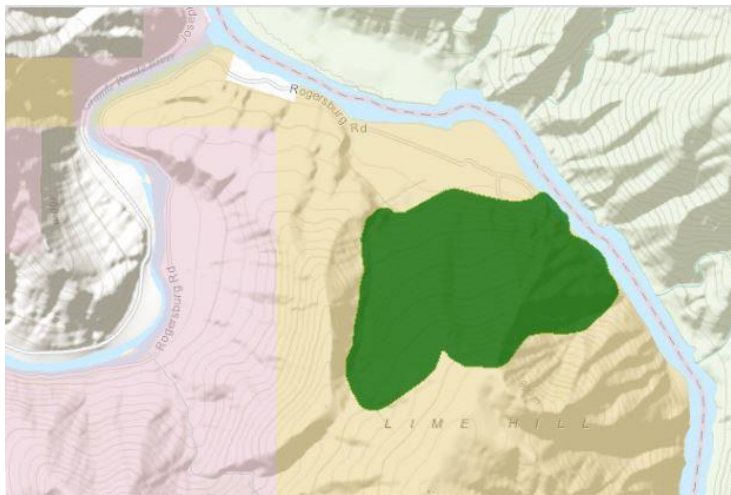


Figure C-15. Distribution of *Cheilanthes feei* at Lime Hill.

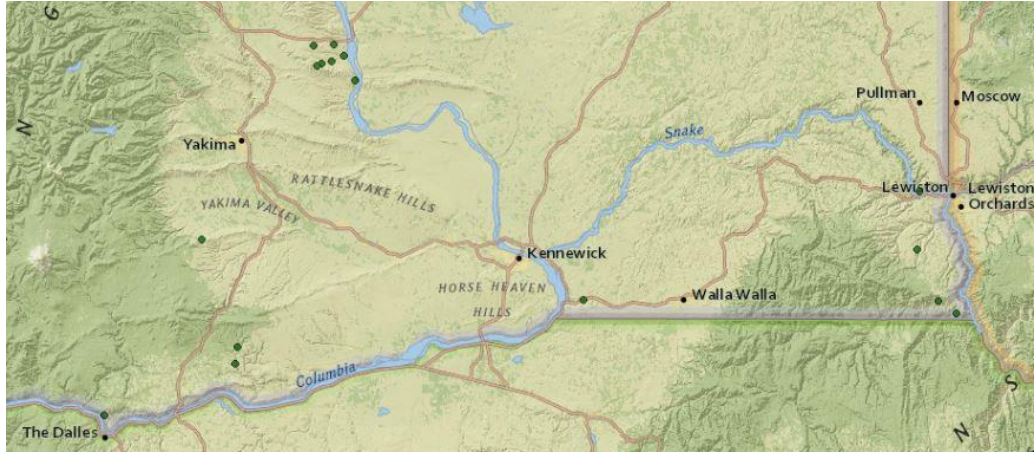


Figure C-16. Distribution of *Cryptantha rostellata* in Washington. This species is closely related to *C. flaccida*, and in the recent past it was included within the latter (Jepson Manual,

1993). Several Washington botanists have regarded this lumping as inaccurate, and in the draft of the FNA treatment of this genus, *C. rostellata* is recognized as a distinct well-delineated species. In Washington, our current records show occurrences in two disjunct areas. One is along the western edge of the Columbia Basin in southern Washington, and the other is near the eastern part of the Blue Mountains. It occurs in several locations in the Blue Mountains grasslands that we have examined; specimens will be sent for confirmation to the Ron Kelley, the FNA author for the Boraginaceae and a specialist in this genus and its relatives. It is widespread in Oregon. Within the Blue Mountains grasslands, WNHP records currently show occurrences near Green Gulch, east of Meyers Creek, and above George Creek. *Cryptantha flaccida* has been reported from other areas; our understanding of the distribution of this species will improve when the taxonomy is better resolved, and we look forward to the coming FNA treatment to facilitate that.

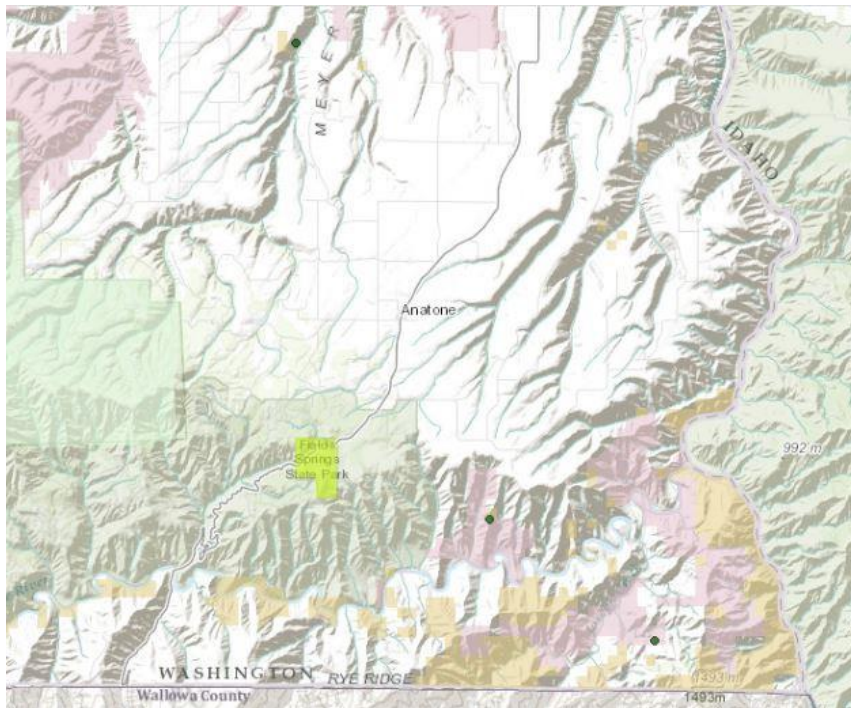


Figure C-17. Distribution of *Cryptantha rostellata* in Blue Mountains grasslands.

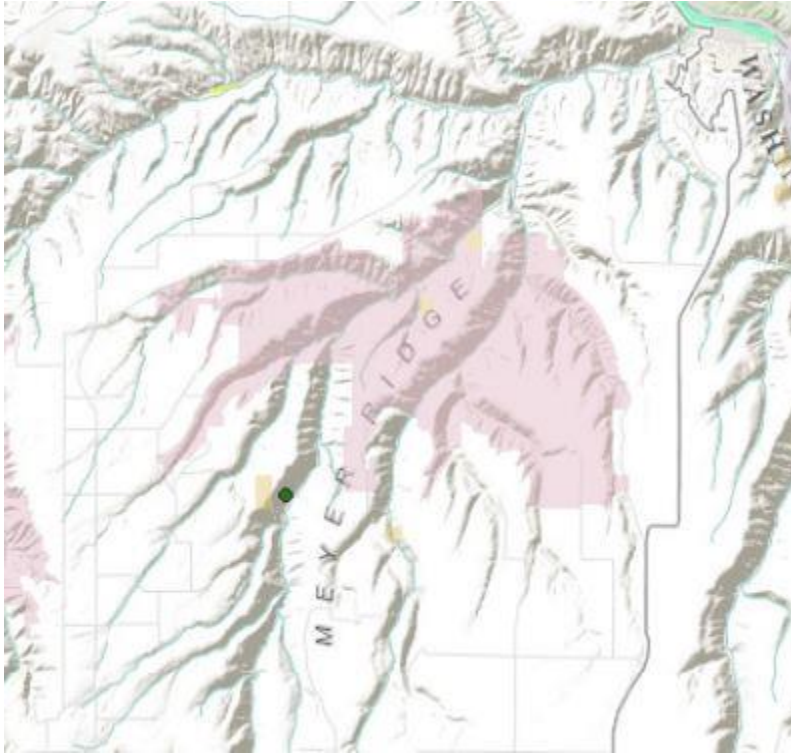


Figure C-17. Distribution of *Cryptantha rostellata* near George Creek.

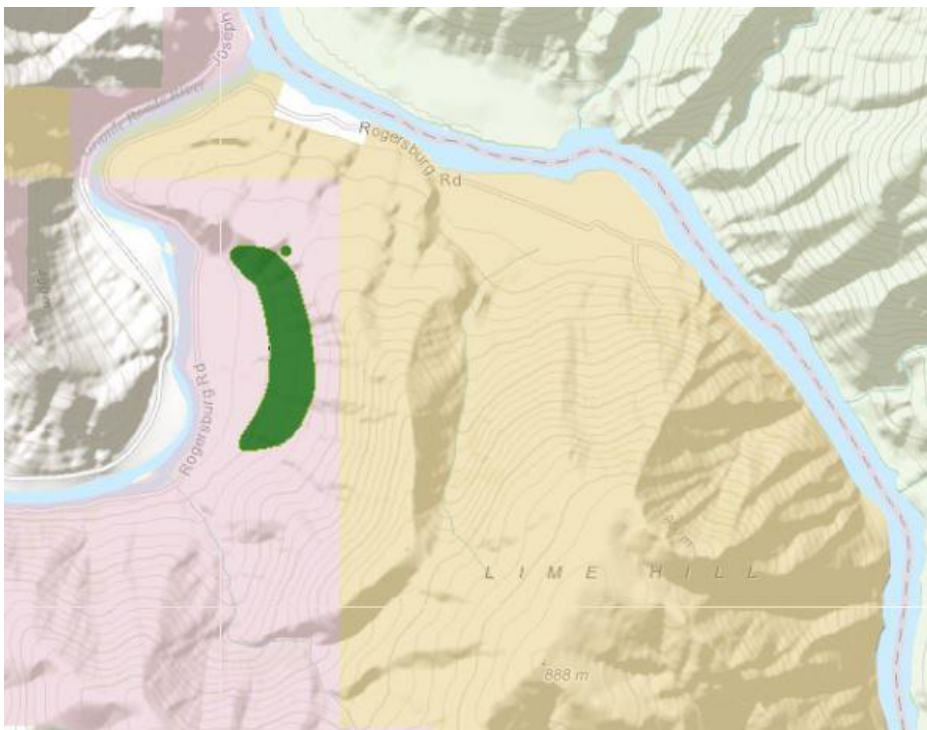


Figure C-18. Distribution of *Diplacus cusickii* at Lime Hill. The occurrence of this species reported at Lime Hill in 1995 is the only known extant occurrence in Washington. In addition to this one there is a historical collection from 1895 from Bingen by Suksdorf. Most of the distribution of the species is to the south, in central Oregon and Idaho.

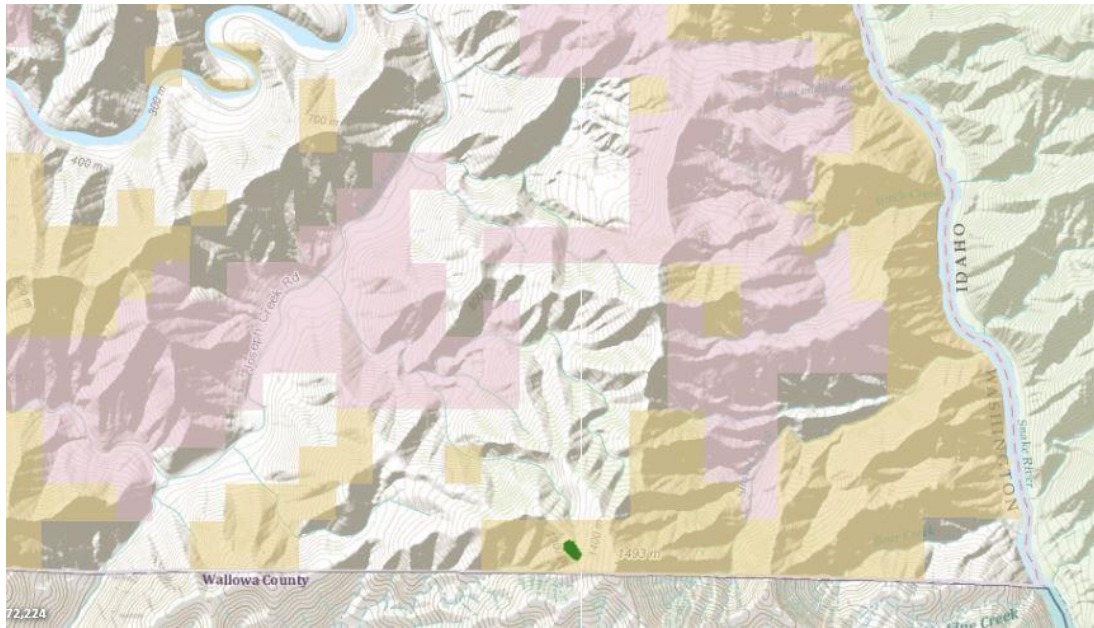


Figure C-19. Distribution of *Erigeron davisii* in Washington. The only known occurrence in the state was reported from near the summit of Mount Wilson. The specimen has not been confirmed, and searching by Roger Ferriell, BLM botanist, did not relocate the occurrence in 2013. It is also found in the Blue Mountains of Oregon and Idaho.



Figure C-20. Distribution of *Erythranthe patula* in Washington. This species has two widely disjunct areas of occupancy in Washington, one in Okanogan County and the other in the eastern Blue Mountains. The taxonomy of this group has also been revised several times, and it does not seem unreasonable that there will be genetic differences found between these groups of occurrences. Most occurrences are from the Blue Mountains.

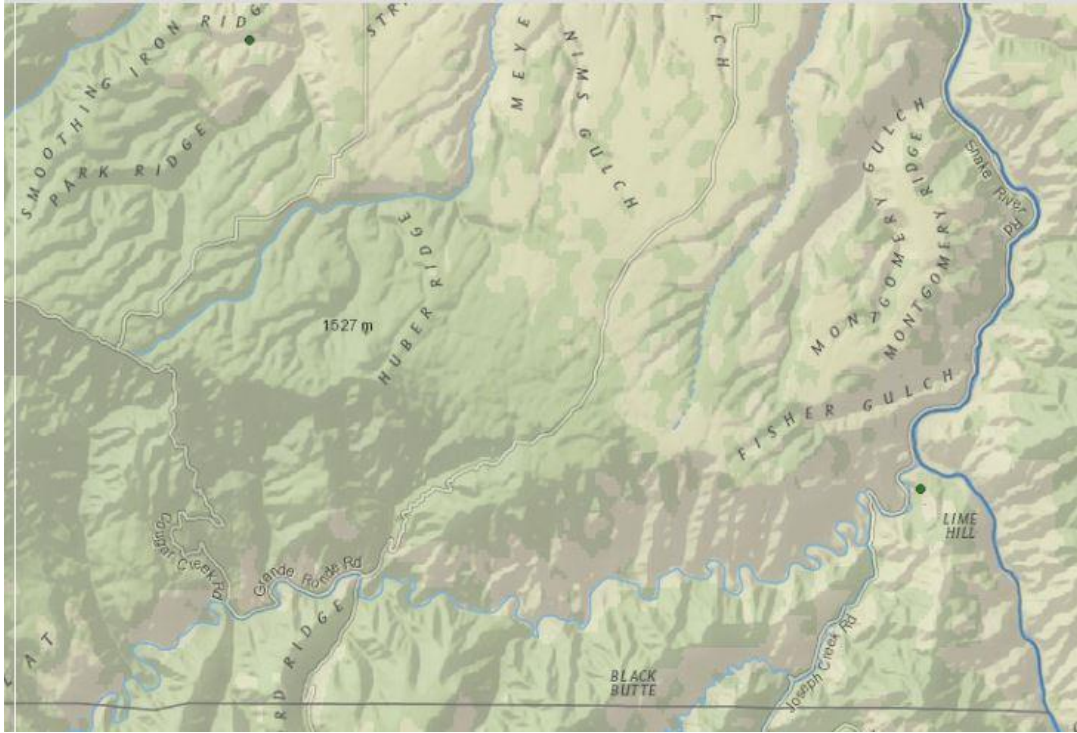


Figure C-21. Distribution of *Erythranthe patula* in Blue Mountains grasslands.

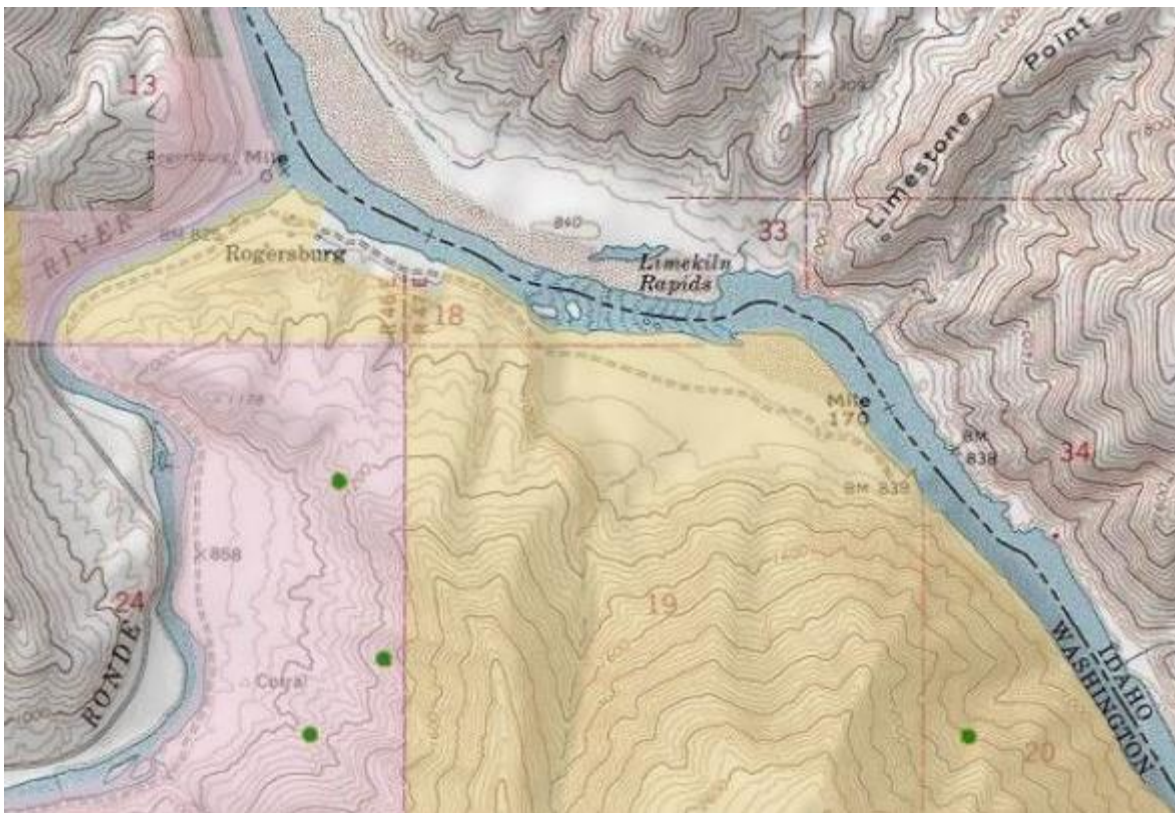


Figure C-21. Distribution of *Erythranthe patula* at Lime Hill.

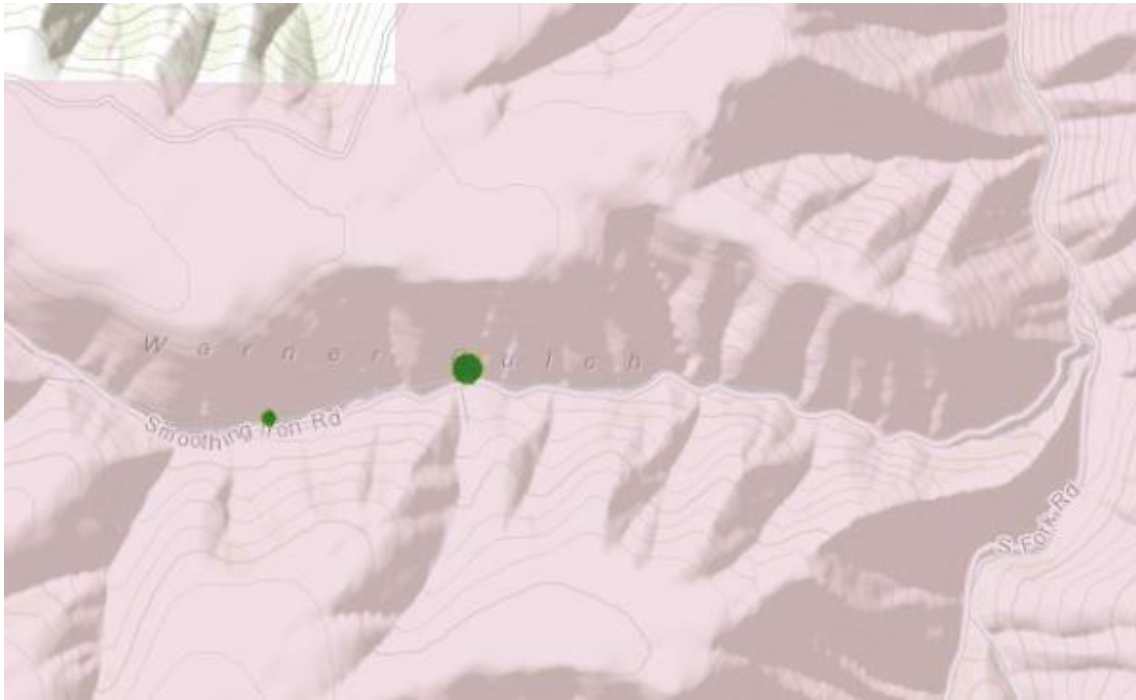


Figure C-21. Distribution of *Erythranthe patula* at Warner Gulch.

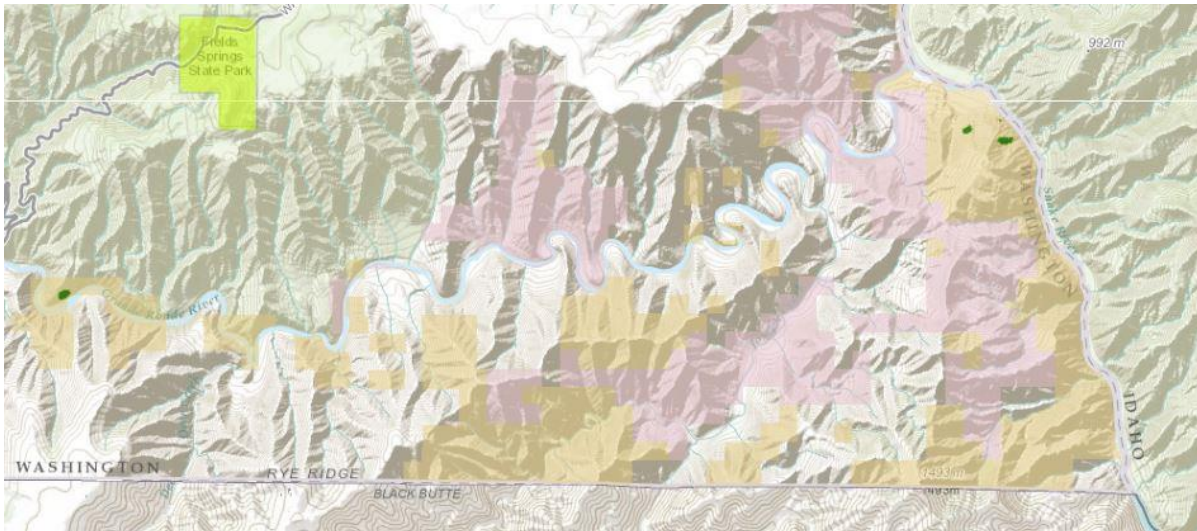


Figure C-22. Distribution of *Hackelia hispida* var. *hispida* in Washington. This taxon is known from two areas, both in Blue Mountains grasslands: Lime Hill and on the north side of the Grande Ronde River twelve miles to the west. Outside of Washington it is known from the Blue Mountains in Oregon.

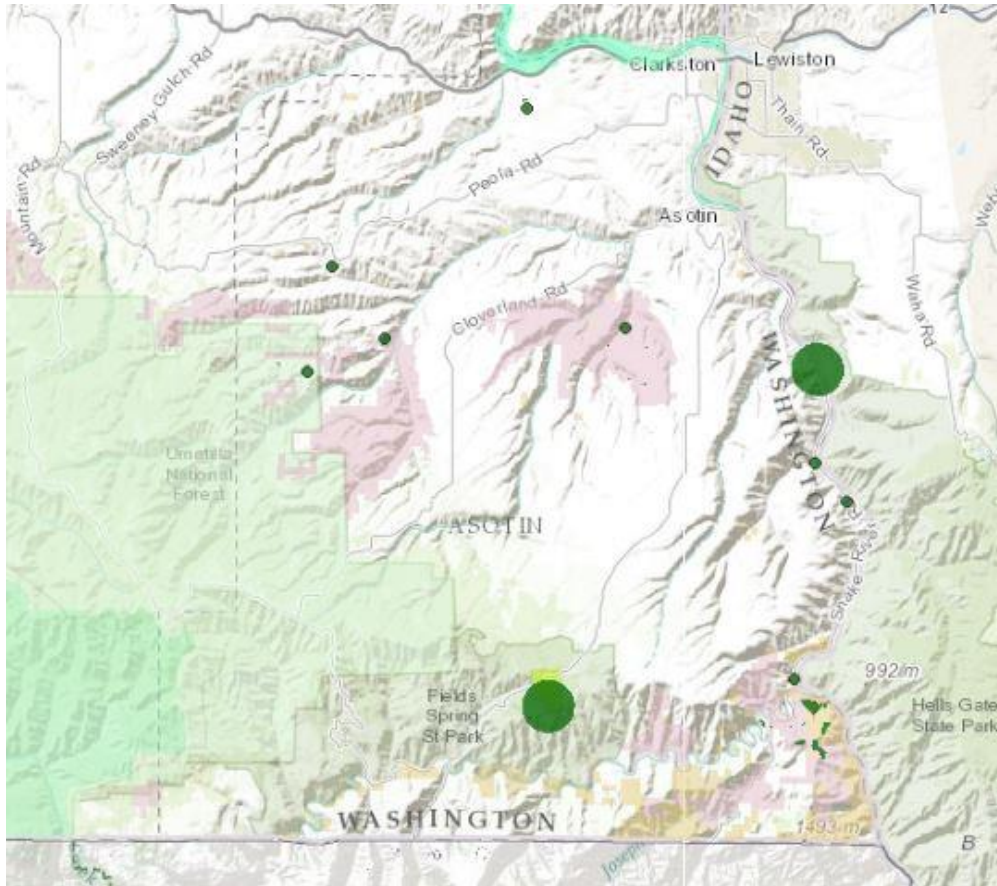


Figure C-23. Distribution of *Lomatium rollinsii* in Washington. This species is a Blue Mountains endemic known from Washington, Oregon, and Idaho. Generally a canyon grassland species found above tributaries of the Snake River as well as along the lower elevations of the Blue Mountains.

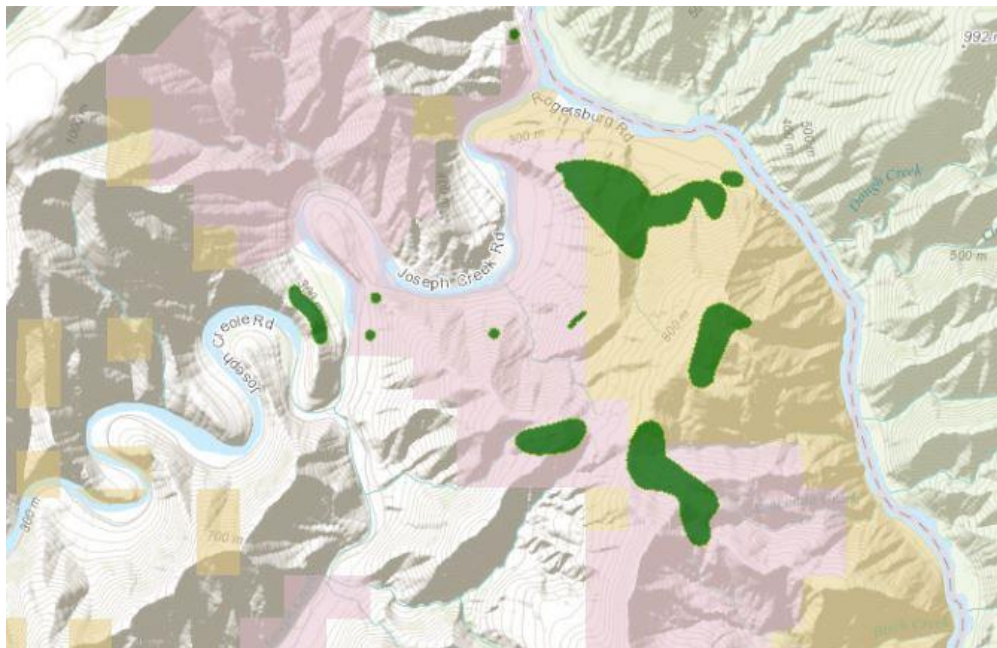


Figure C-24. Distribution of *Lomatium rollinsii* on Lime Hill and surrounding areas.

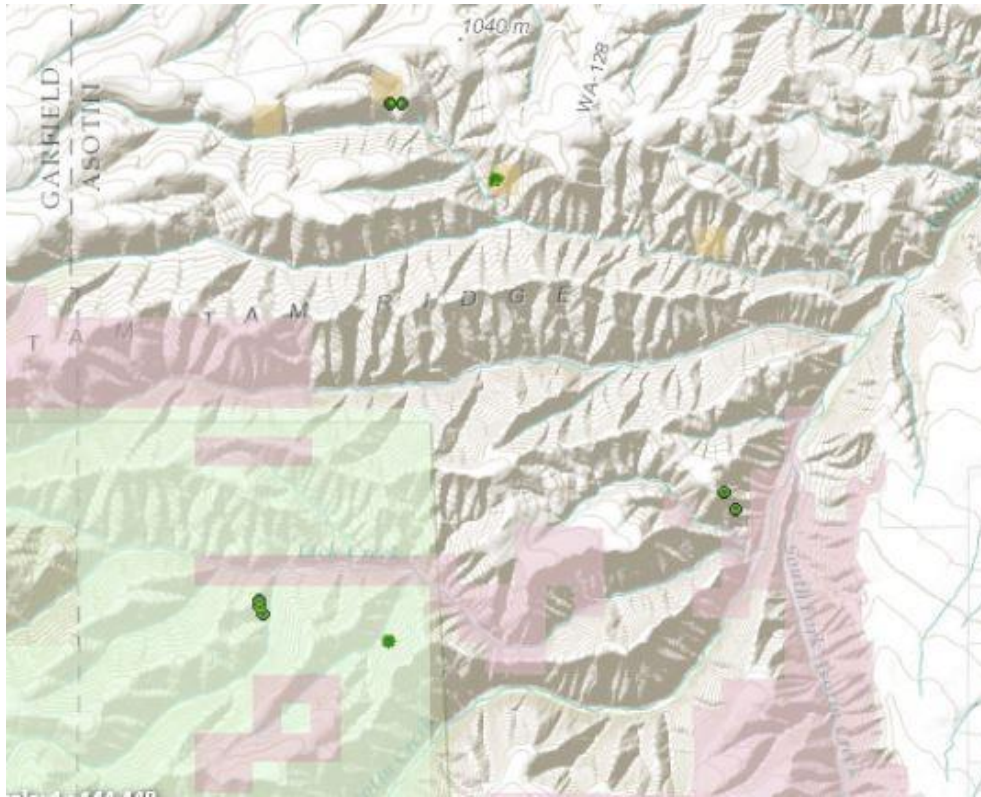


Figure C-24. Distribution of *Lomatium rollinsii* at Asotin Creek.

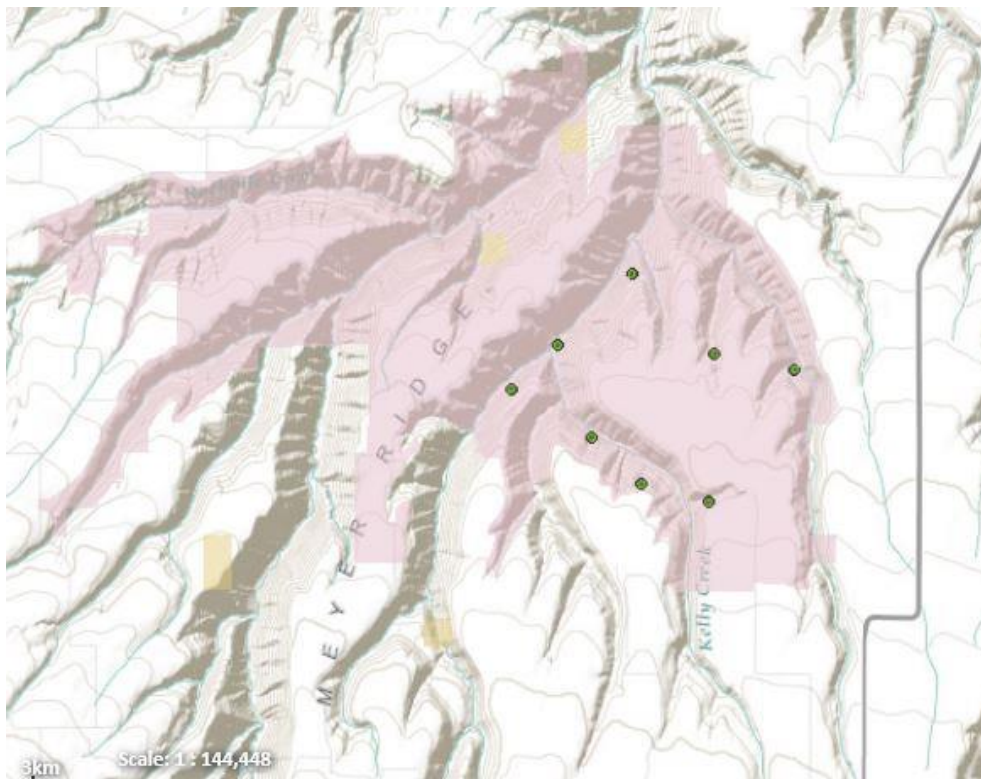


Figure C-24. Distribution of *Lomatium rollinsii* at George Creek.

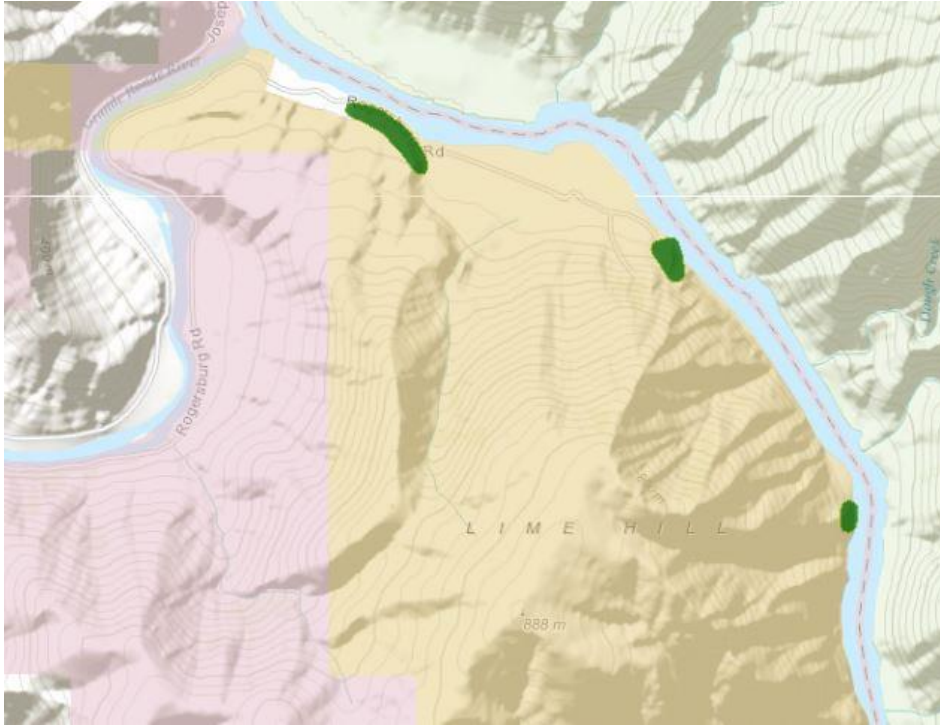


Figure C-25. Distribution of *Lomatium serpentinum* in Blue Mountains grasslands. With the exception of a 1970 collection and a 1964 collection from near Walla Walla, all the known occurrences of this species are along the Snake River. It is fairly abundant along the Snake River on BLM land in the Lime Hill area. Elsewhere it occurs along the Snake River in Oregon and the Salmon River in Idaho.

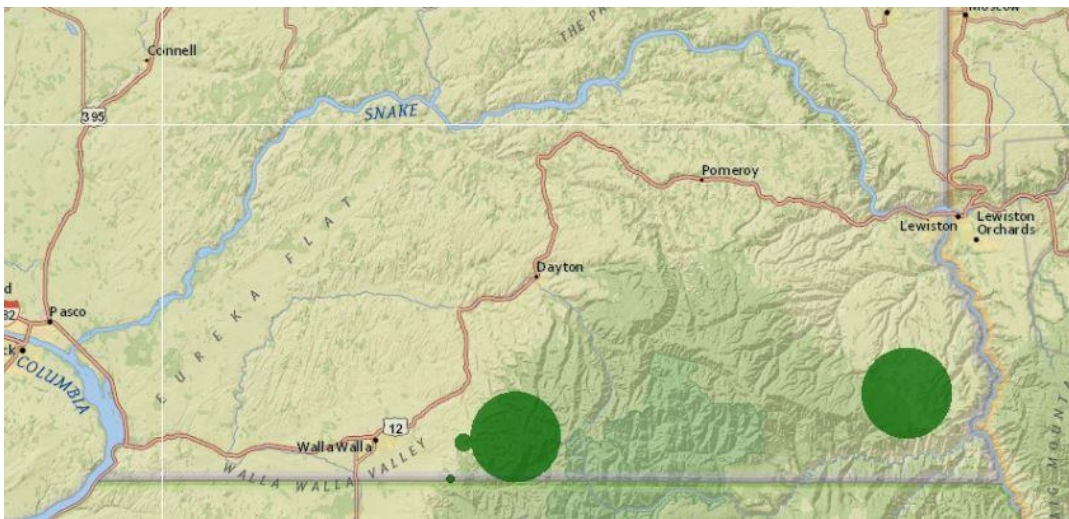


Figure C-26. Distribution of *Lupinus sabinianus* in Blue Mountains grasslands. Only four element occurrences are known to occur in Washington, and three of these are historical collections. One was reported in 1949 just north of Anatone, the others are on the western edge of the Blue Mountains, just east of Walla Walla. The most recent observation was from Biscuit Ridge in 1992. Finding this in either of the study areas is a low probability, but its historical occurrence near Anatone suggests it is a species to look for. Elsewhere it is found in the Blue Mountains in Oregon.

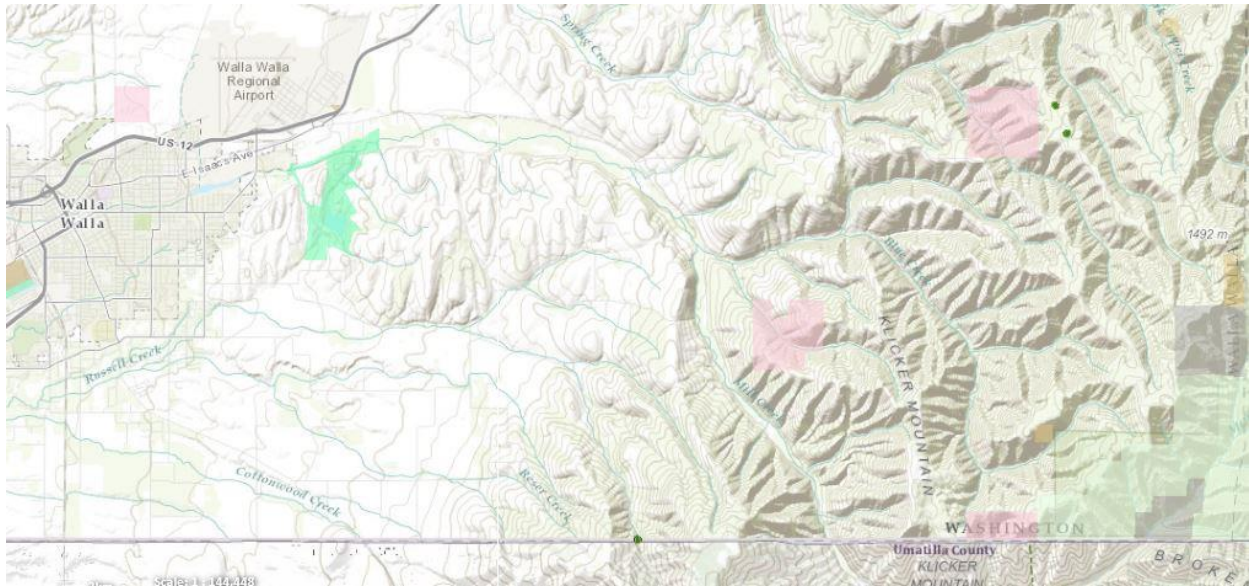


Figure C-27. Closer view of distribution of extant occurrences of *Lupinus sabinianus* in Blue Mountains grasslands east of Walla Walla.

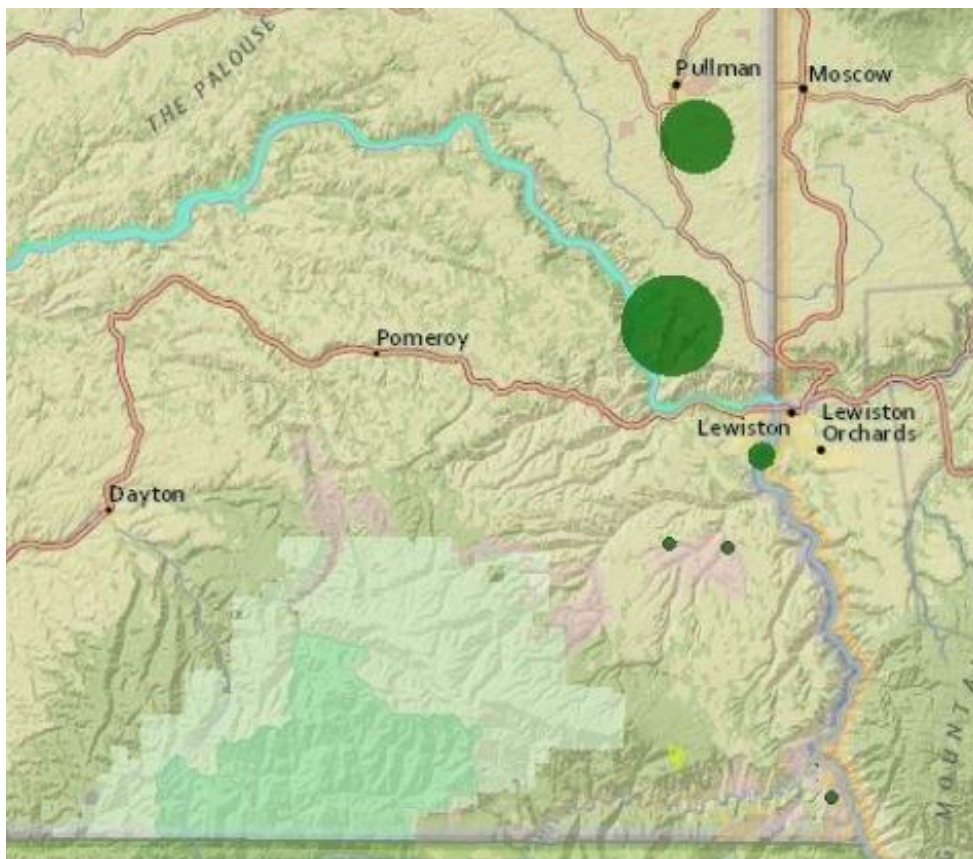


Figure C-28. Distribution of *Oenothera cespitosa* ssp. *marginata* in Washington. In addition to these sites there is a report from Klickitat County. This taxon is widespread in Oregon and Idaho; in Washington it is known in the eastern Blue Mountains, from the grasslands along the outer edges up into the mountains.

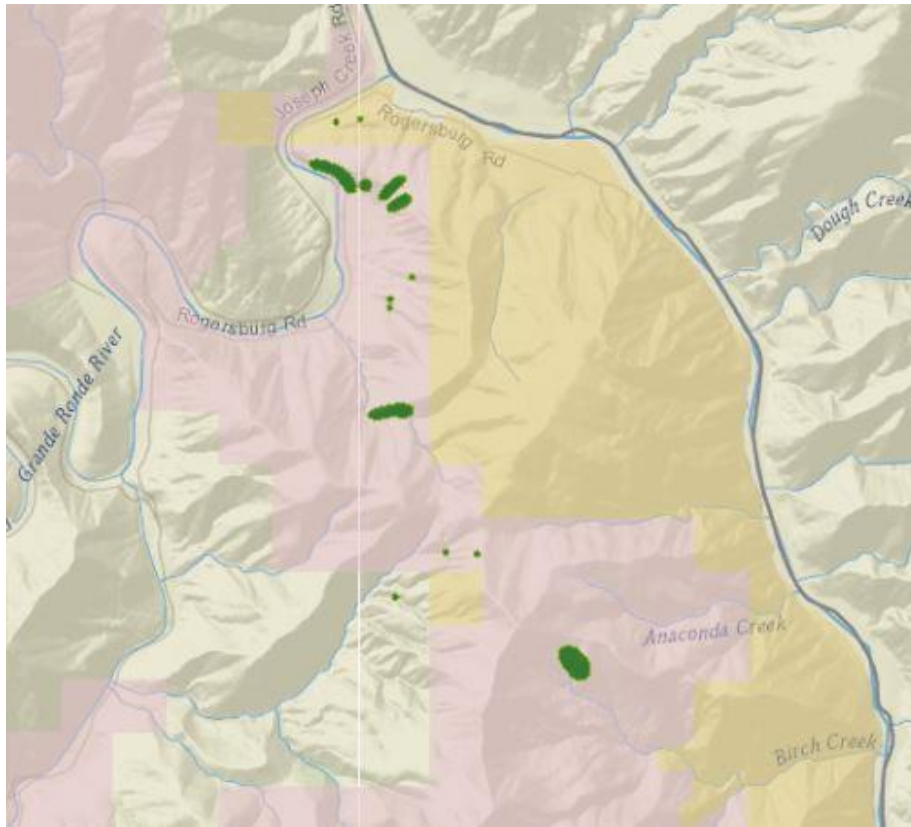


Figure C-29. Distribution of *Oenothera caespitosa* ssp. *marginata* in the Lime Hill area.

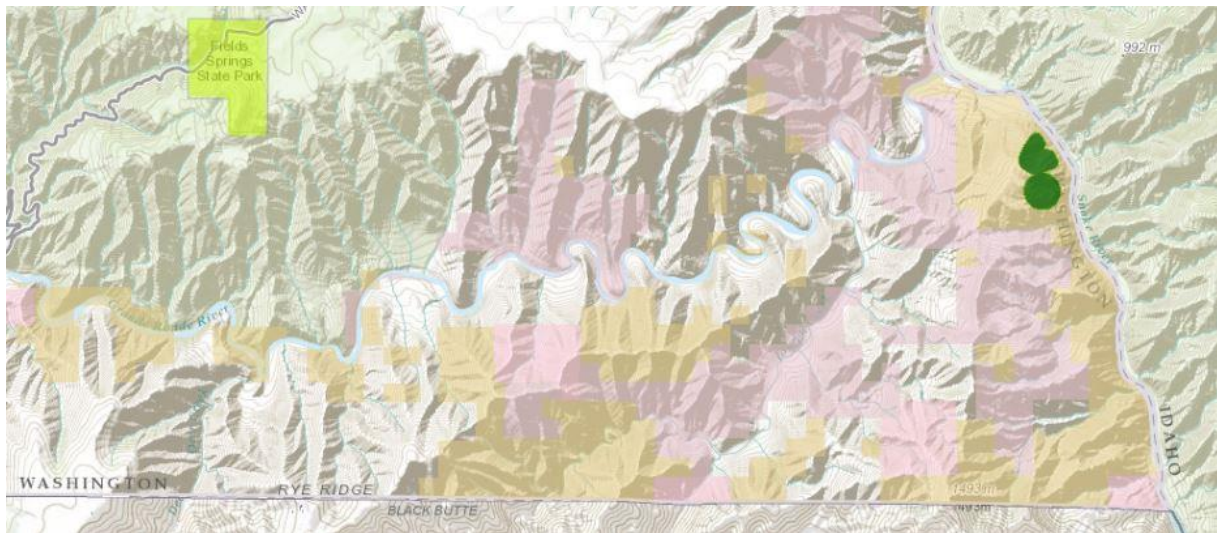


Figure C-30. Distribution of *Petrophytum caespitosum* ssp. *caespitosum* in Asotin County. This is the only known occurrence in Washington. The single known occurrence in Washington grows on the east side of Lime Hill. It is widespread in Idaho, Montana, Nevada, Arizona, Colorado, and Wyoming

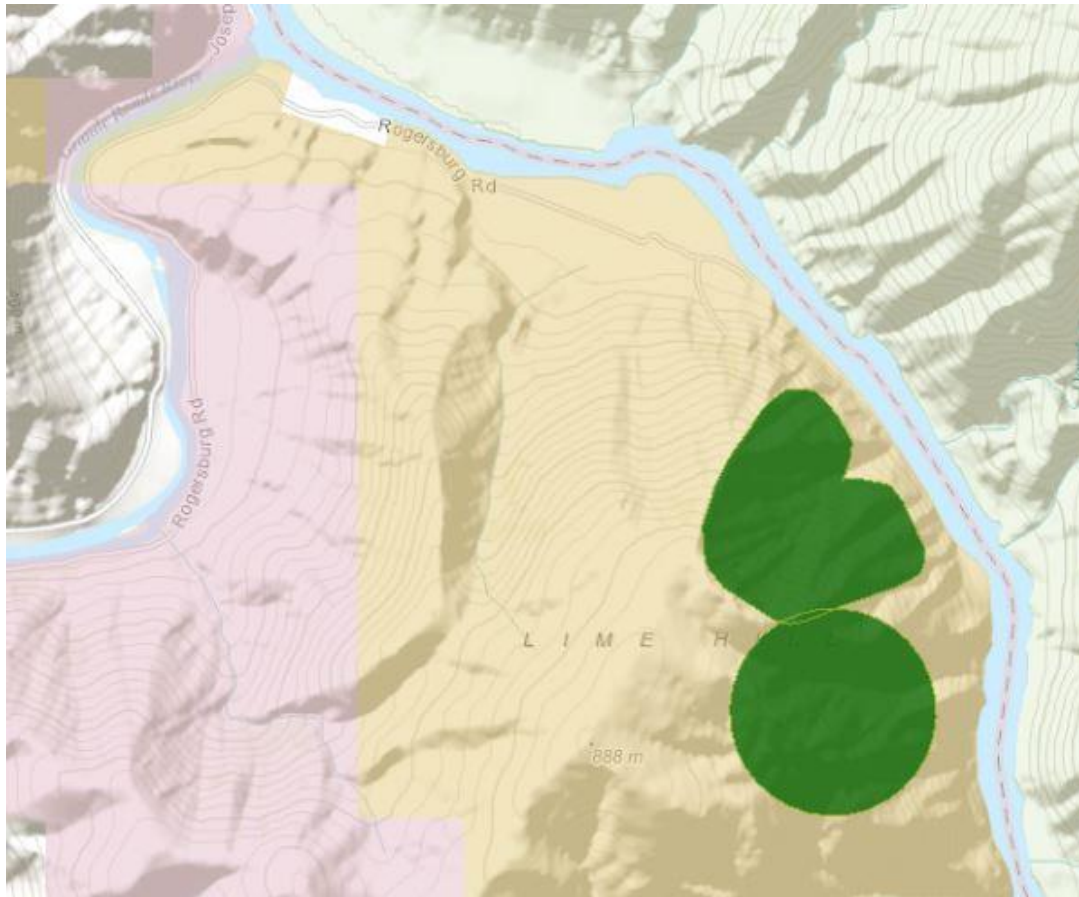


Figure C-31. Distribution of *Petrophytum caespitosum* ssp. *caespitosum* on Lime Hill.



Figure C-32. Distribution of *Pyrrcoma scaberula* in Washington. This is a Blue Mountains endemic of Washington, Oregon, and Idaho.

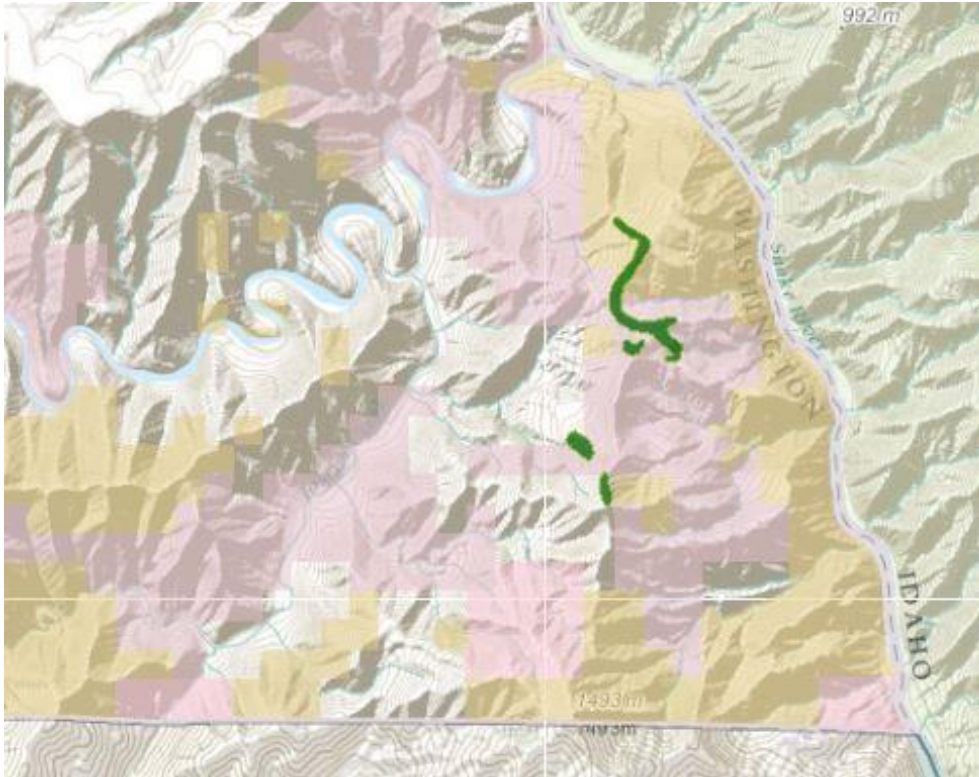


Figure C-33. Distribution of *Pyrocoma scaberula* in the vicinity of Lime Hill.

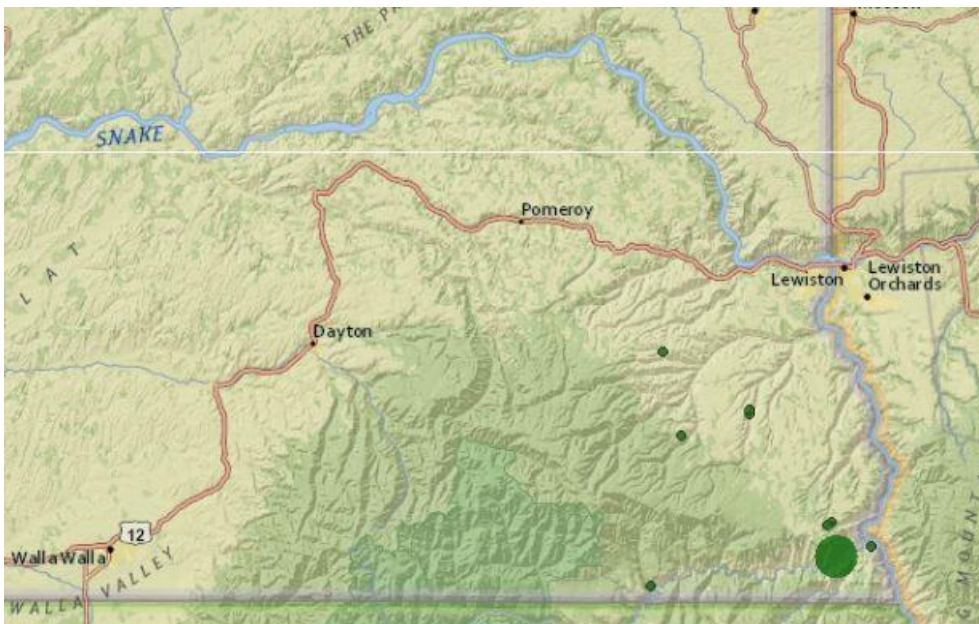


Figure C-34. Distribution of *Ribes cereum* var. *colubrinum* in Washington. The species is limited in distribution to the Blue Mountains. Six extant occurrences, all fairly limited in size, are known from Washington; it is reported from Lime Hill, from Fisher Gulch, and north of Meyers Ridge, west of Highway 129 along the Grande Ronde, from WDFW land on Smoothing Iron Ridge, on BLM north of Tam Tam Ridge. There is also a historical collection from Lions Rock, near Blewett Pass. A scattering of occurrences is also known from Oregon.



Figure C-35. Distribution of *Ribes cereum* var. *colubrinum* on Lime Hill.

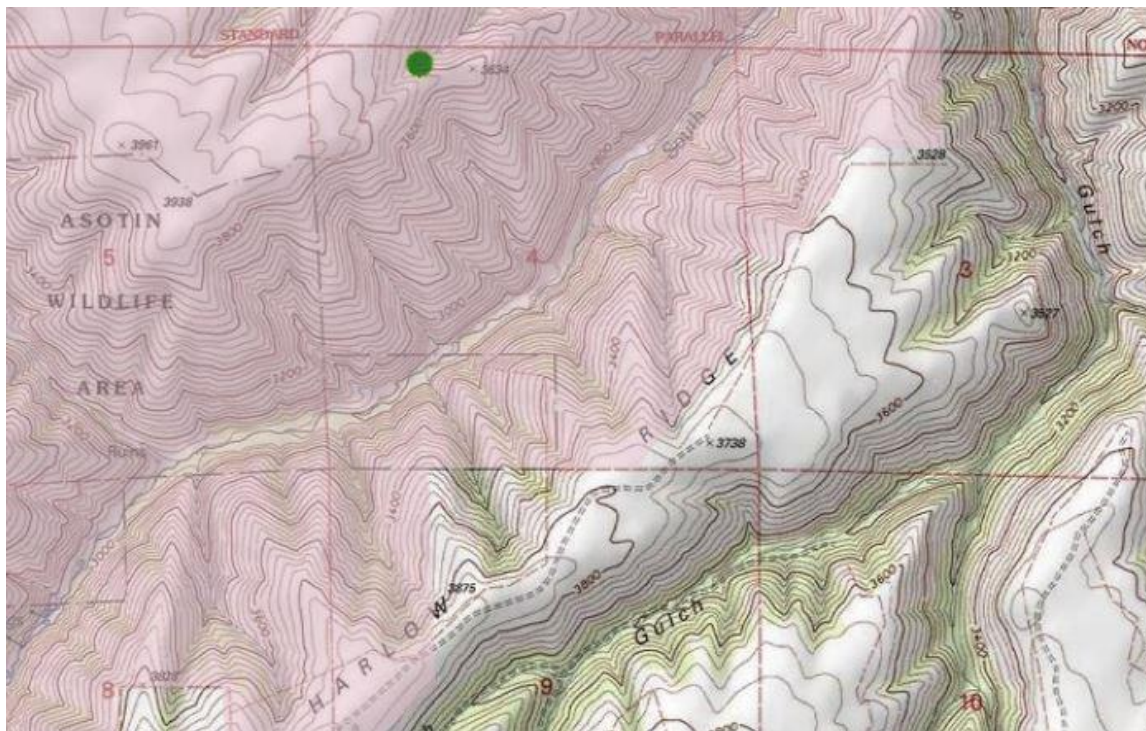


Figure C-35. Distribution of *Ribes cereum* var. *colubrinum* in the Asotin Creek Unit of the Asotin Wildlife Area.

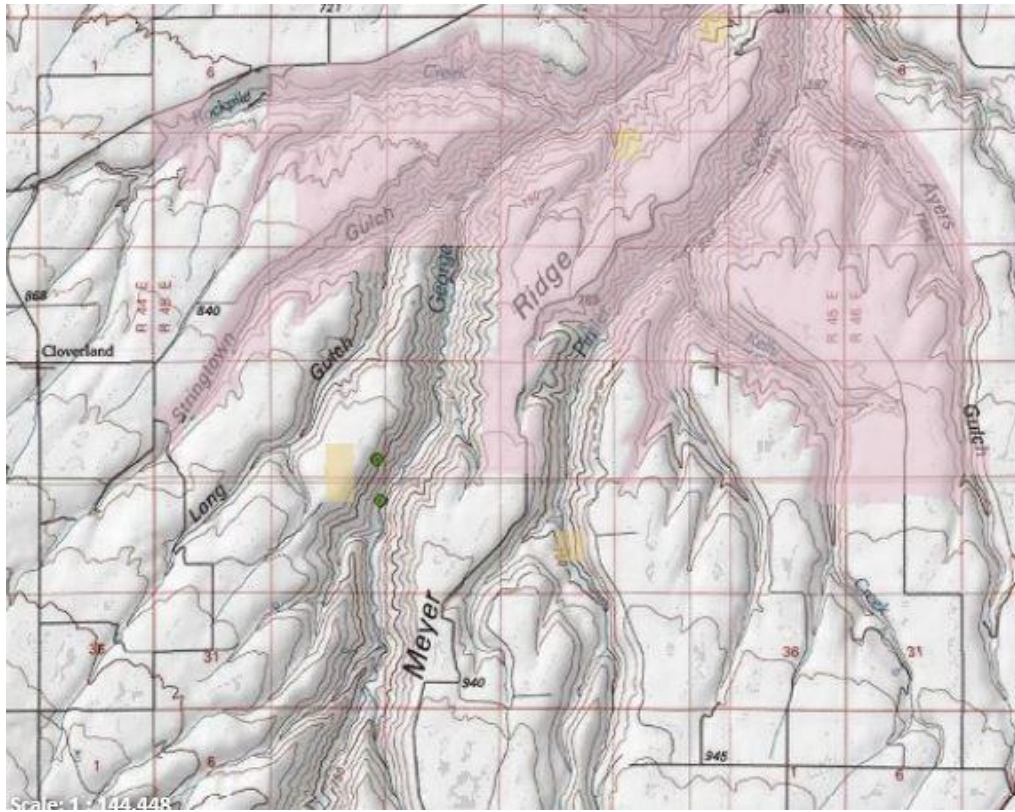


Figure C-35. Distribution of *Ribes cereum* var. *colubrinum* in the George Creek Unit of the Asotin Wildlife Area.



Figure C-36. Distribution of *Ribes oxyacanthoides* var. *irriguum* in Washington. Occurrences of this species are scattered along the eastern edge of Washington, almost to the Canadian border. It is also widespread in Idaho, Oregon, and Montana.

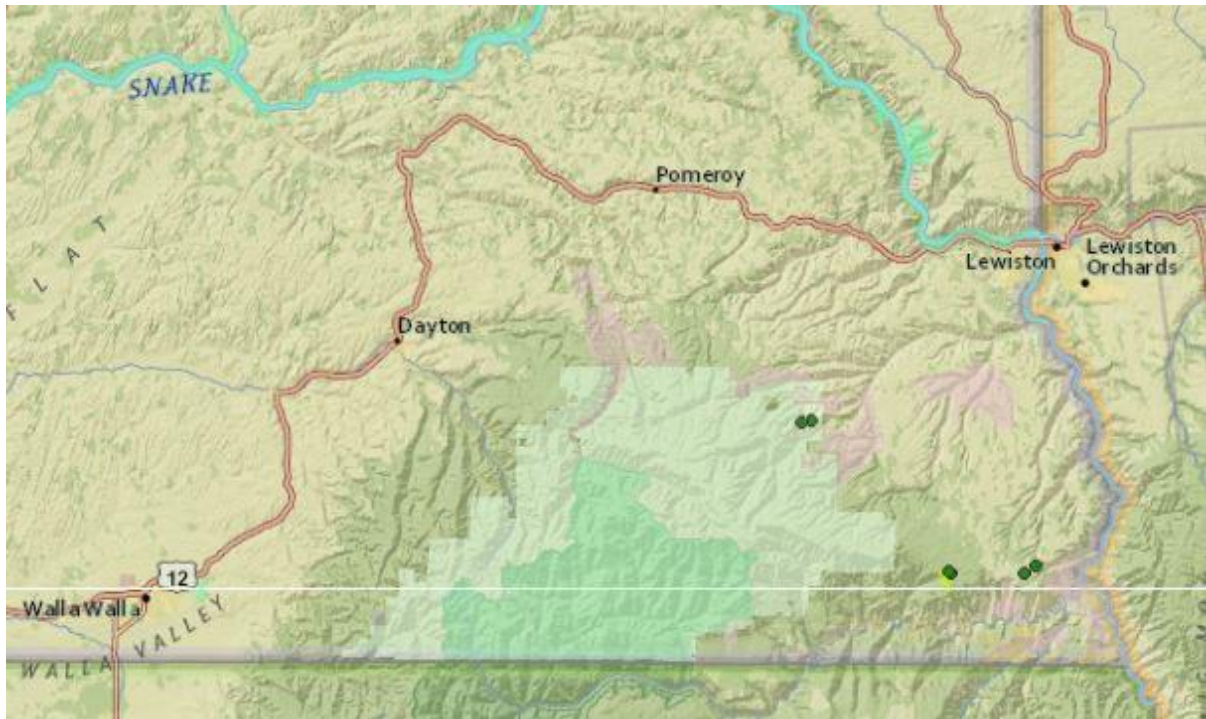


Figure C-37. Distribution of *Ribes oxyacanthoides* var. *irriguum* in Blue Mountains grasslands.



Figure C-38. Distribution of *Rubus nigerrimus* in Washington. At least one plant has been reported from Lime Hill, and it has been reported in the lower part of Fisher Gulch. All other known occurrences are from outside of the ecoregion in lower tributaries along the Snake River below Clarkston.

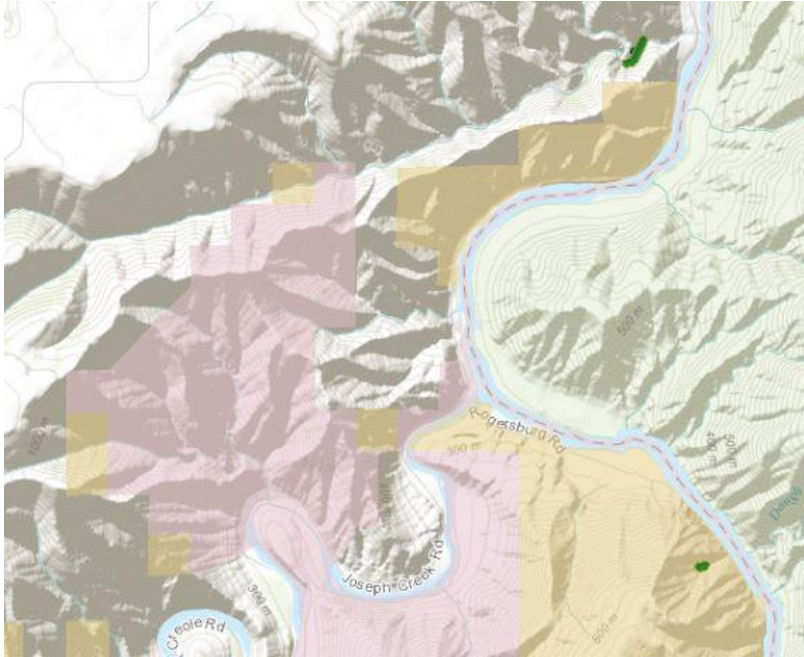


Figure C-39. Distribution of *Rubus nigerrimus* in Blue Mountains grasslands.

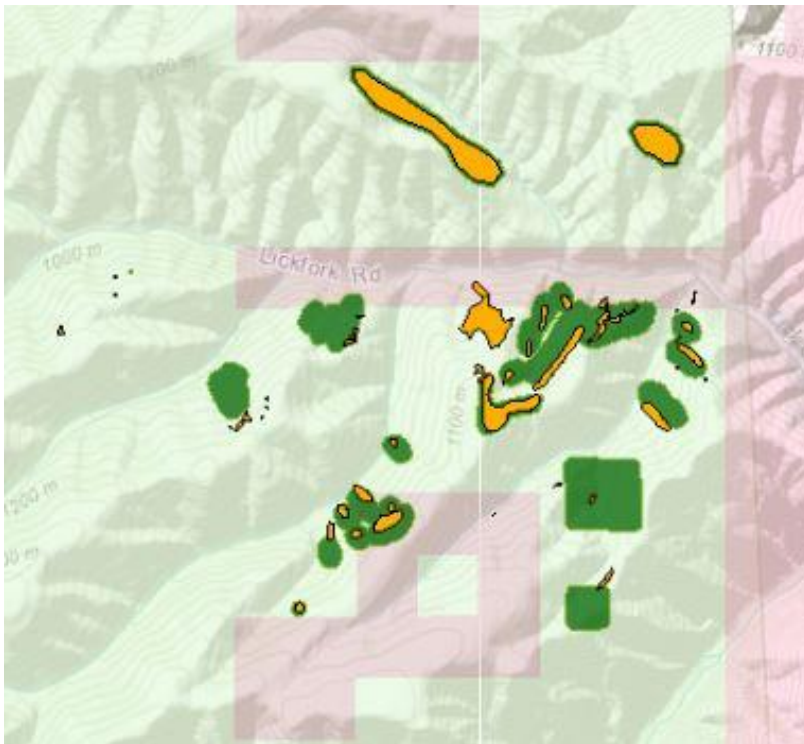


Figure C-40. Distribution of *Silene spaldingii* in Blue Mountains grasslands, from Cabin Ridge to Bracken Ridge. The orange color represents Forest Service sightings from 2013. This species is widespread in eastern Washington, in numerous small populations. Several large populations have been found within the past few years in the Blue Mountains grasslands in Washington. The Smoothing Iron occurrence is likely the largest population in the state. Populations are also found in Oregon, Idaho, and Montana.

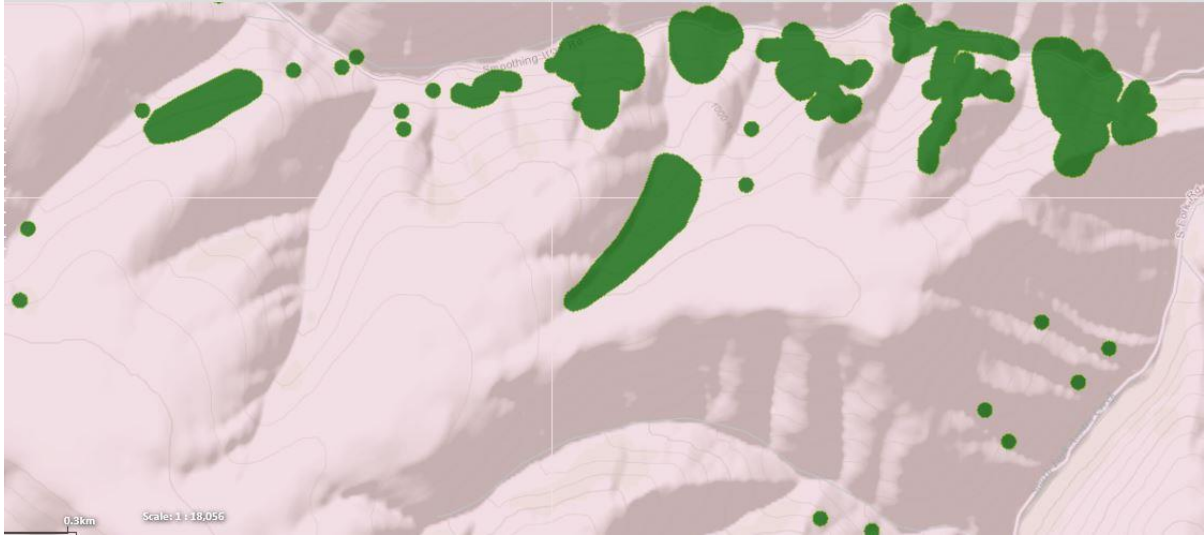


Figure C-41. Distribution of *Silene spaldingii* in Blue Mountains grasslands, in the Smoothing Iron Ridge area.



Figure C-42. Distribution of *Spartina pectinata* in Washington. Very few populations of this species are known from Washington, but they are reported from nearly every corner of the state. In the Blue Mountains it has been reported from along the Grande Ronde and Snake Rivers.

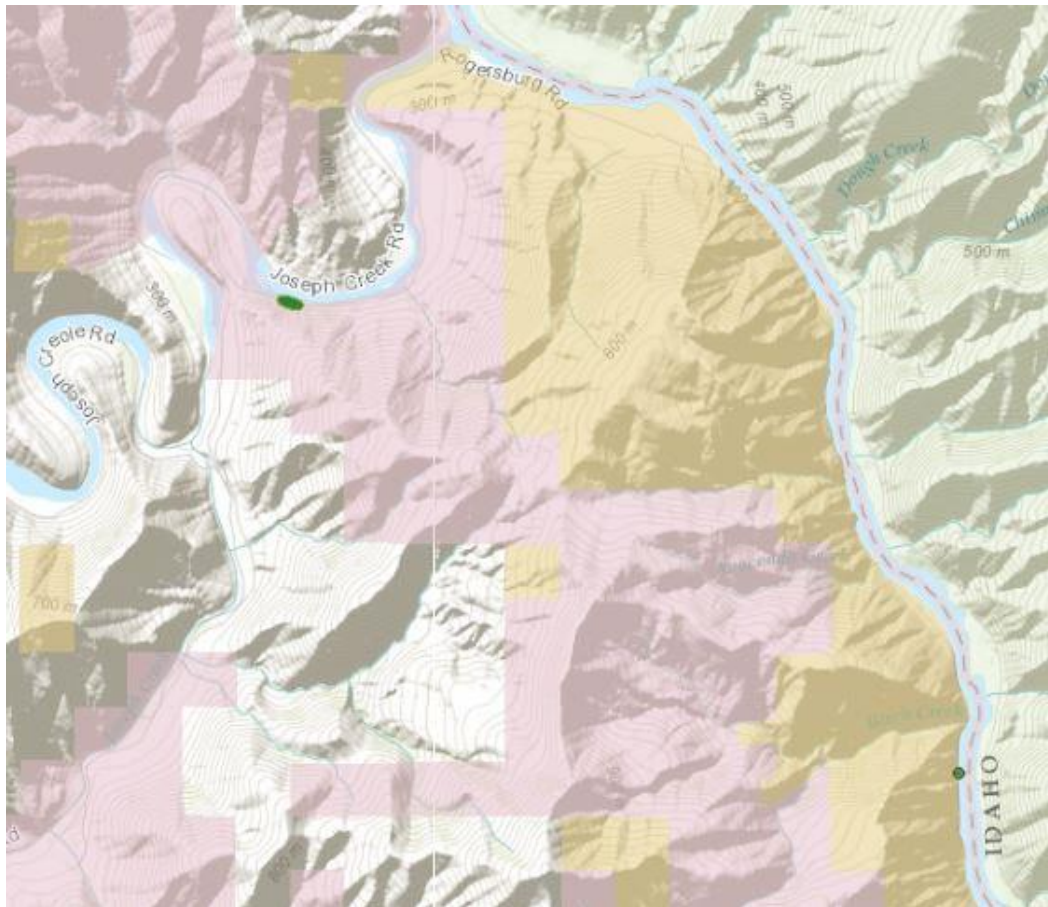


Figure C-43. Distribution of *Spartina pectinata* in the vicinity of Lime Hill.

APPENDIX C: Review of DNR ownerships (current or transferred to WDFW) in Blue Mountains grasslands.

Location	Legal	Ownership	Notes
South of the Grande Ronde River			
Lime Hill	T7N R46E Sec 36	DFW (previously DNR)	Ownership transferred as part of WDFW phase 2 exchange. Access via ATV up Green Gulch (WDFW) off Joseph Creek Road. <i>Astragalus arthuri</i> , <i>Astragalus cusickii</i> and <i>Pyrrocoma scaberula</i> reported on the edges of the section.
Mt. Wilson	T6N R46E Sec 12	DNR	Adjacent to proposed Mt Wilson RNA; <i>Cryptantha rostellata</i> , <i>Astragalus arthuri</i> , <i>Astragalus cusickii</i> , <i>Calochortus macrocarpus</i> var. <i>maculosus</i> . Under lease, accessible by ATV. Report of heavy ATV use.
McDuff Rapids	T6N R47E Sec 16	DNR	Small part of a section adjacent to the Snake R., OR, ID. Only accessible by jet boat on Snake river.
Joseph Creek Rd.	T6N R46E Sec 16	DNR	Spans the road, small parcel on OR border. Under lease to Wallane Crop (Karl Magden 509-243-4532).
Chief Joseph Wildlife Area	T6N R46E Sec 6	DNR	Isolated section between Joseph Canyon and the Grande Ronde, adjacent to DFW, BLM, private. Portion of this parcel burned around labor day 2013 in Grande Ronde Fire. Leased to Rockn J Properties for cattle grazing. Manager Chris Cunningham (541) 398-2484. Best vehicle access from Oregon via Rockn J private ownership.
Shumaker Unit	T7N R45E Sec 36	DFW (previously DNR)	Spans the Grande Ronde. From across the river some looks to be in good condition. Traded to WDFW in phase 2 exchange. Majority burned in Grande Rhonde Fire 2013. Boat across river or walk across during summer months during low flows. (Motor boats not allowed by county ordinance).
Near Bufford Creek	T7N R44E Sec 36	DNR	Leased to Rockn J Properties for cattle grazing. Manager Chris Cunningham (541) 398-2484. Access along river from Hwy 129.

Cape Horn Area			
Cape Horn and Cabin Ridge	T9N R43E Sec 16	DNR	High quality grassland, <i>Pinus ponderosa</i> , undescribed Phlox, <i>Calochortus macrocarpus</i> var. <i>maculosus</i> . Under land use license to Tom Hendrickson for cattle grazing in conjunction with Forest Service Permit. Surrounded by USFS. Access via Asotin Creek to Lick Creek FS road. Within Elk calving area that is subject to road closures.
Asotin Wildlife Area			
Asotin Creek Unit	T9N R44E	DNR	Under leases to WDFW. N2N2 Section 4 is leased to Thornton for Cattle grazing. Access via Asotin Creek up Charlie Creek. And Asotin Creek to Lick Creek and Spur Road. Section 1&2 under lease for Dryland Ag to SJ Farms.
George Creek Unit	T9N R45E Sec 16	DFW (was DNR)	Traded to WDFW via Phase 2.
Dry Gulch	T10N R43E Sec 36	DNR	At north edge of Blue Mountains Ecoregion. Under 2 leases N2 for Grazing and CRP to Blankenship 509-758-9710 cell 751-6007 Access via Peola Road to North. S2 Grazing lease John Lloyd Brooks 758-7477 Access private road through WDFW and Brooks private off of Fitzgerald Road.
Wooten Wildlife Area			
Cummings Creek	T10N R41E Sec 35&36	DNR	Under lease to WDFW. Access via Cumming Creek off of Tuccannon Road. Subject to area closure for Wildlife.
Other Columbia County DNR land with grasslands in Blue Mountains Ecoregion			
S Fork Touchet River	T9N R39E 16	DNR	Mix of fee ownership and mineral rights; includes development and farmed land, leases unleased areas. PTS NE4 leased to Bowen for grazing and Dryland. Access Robinette Mtn Rd and S. Fork Touchet. W2NE4 leased to Carlton for Dryland Ag. Access Pettyjohn Grade. W2SE4, SE4SE4 leased to Broughton Land for Dryland Ag. Rest is unleased or private.
Hompegg Falls	T8N R40E Sec 16	Private (was DNR)	Scattered trees and grassland. No longer DNR traded in Central Cascade Exchange (2004?)
Wolf Fork	T8N R39E Sec 36	Private (was DNR)	Scattered trees and grassland. No longer DNR; traded in Central Cascade Exchange (2004?)
Burnet Fork	T7N R39E Sec 16	DNR	Limited grassland. Remote access unleased. May include old growth timber. Access via foot from USFS RD. Possible close ATV Access via Rainwater Land up S. Touchet.

APPENDIX D. Contacts for conservation work in the Blue Mountains.

Last name	first name	phone	email	address, notes
Barnett	Emma		Emma.barnett@dnr.wa.gov	DNR grazing leases
Bohnet	Mark			DNR regional manager
Cloud	Ryan	509/545-2025		DNR land manager
Cunningham	Chris	541/398-2484		Manager in Joseph Canyon area, for Rocknj Properties
Darrach	Mark	(360) 204-0233	mdarrach@fs.fed.us	FS botanist
Denny	Mike		mikepcdistrict@qwestoffice.net	Pomeroy Conservation District. CREP cluster coordinator
Dice	Bob	office: 758-3151; cell: 509/780-2293	dicerid@dfw.wa.gov	Manager of the wildlife management areas in Asotin County. 1049 Port Way Clarkston, WA 99403
Ferriell	Roger	541-523-1424	rferriell@BLM.gov	BLM Baker
Frazees	Joan	541/278-3931	jfrazee@fs.fed.us	Umatilla National Forest botanist
Fujishin	Monte			USFS, district ranger?
Magden	Karl	509/243-4532	-	Grazing permit on DNR near Mt Wilson
Merg	Kurt		kurt.merg@dfw.wa.gov	WDFW range conservation
Owens	Tom		-	WDFW, GIS
Robinette	Kevin		kevin.robinette@dfw.wa.gov	WDFW, Regional Wildlife Habitat program manager
Schirm	Tom		thomas.schirm@dfw.wa.gov	WDFW lead for Wildlife Habitat Program