2015 ISSSP Project - Final Report

The Search for Lakeview’s Obscure Taxa

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Summary

All told, 890 acres of potential habitat were surveyed in 2015 for “obscure taxa” of Lakeview Resource Area on Lakeview BLM District. Three documented occurrences, two Agastache cusickii and one Allium geyeri var. geyeri, were confirmed to be misidentifications. Potential habitat of Pilularia americana was surveyed unsuccessfully, but several areas were identified as not having suitable ecological conditions. Additionally, the confusion around the Leiberg’s historical collections at Button Springs has been clarified as it appears these collections were made at a playa several miles northeast of the actual Button Springs locality. The annual Mimulus spp. continue to be elusive and further monitoring should be conducted when drought conditions abate in Lake County. Although we were unable to confirm the presence of Elatine brachysperma at the Potholes observation record, we did locate it at another site. The new population found at Featherbed Lake was small, but ample habitat is present in the area to support a larger population in more favorable years.

Pilularia americana

Pilularia sites were visited on May 13 and July 22. No plants were found during these surveys. Several sites that were identified as potential habitat clearly did not have the appropriate ecological characteristics. The historical specimen reported to have been collected at Button Springs most likely came from an un-named alkali flat on the Lake/Deschutes County line, 2.7 miles northeast of Button Springs.

Interestingly, a note on a 1980 Castilleja pilosa voucher (Ertter #3850) from the playa along the Deschutes/Lake County line notes that this is “probably site of Leiburg 1894 collections.” John B. Leiberg made several collections in 1894 with the locality listed as near Button Springs, including the Pilularia americana specimen that is the source for the ORBIC observation at Button Springs. These collections have been mapped at the Button Springs location in modern databases, although it appears that the collections were not made at the spring site. The 2015 site visit to the Button Spring locale did not find several of the species reported to have been collected at Button Springs. The spring flows from a short basalt rimrock outcrop into a large excavated stockpond (Fig. 1). The pond has steep shores and gravely substrate, which does not match the preferred habitat for Pilularia americana (Fig. 2).

The broad alkali playa on the county line (T23S R17E Section 5) was dominated by Artemisia cana with areas of drying mud throughout the flat. Several vernal pool associates including Castilleja campestris, Myosurus minimus, Psilocarphus brevissimus, Navarretia leucocephala, Polygonum polygaloides, Gratiola ebracteata, Plagiobothrys hispidulus, Polycntenium fremontii, and Muhlenbergia richardsonis were found in the mud patches (Fig. 3). The presence of these species indicates suitable site hydrology to support Pilularia. Three stockponds have been constructed within the alkaline flat. Cattle were present at the Deschutes County waterholes and no vegetation was present along the pond margins. The waterhole on the Lake County portion was constructed in 1970. Plagiobothrys scouleri and Ranunculus aquatilis were prevalent around the margins of this stockpond. The Lake County side of the
playa is privately owned. Although *Pilularia* was not observed during this visit, this appeared to be the most suitable habitat out of all the sites surveyed in northern Lake County.

A playa mapped at T25S R17E Section 4 did have clay soils, but it did not have adequate hydrology to support *Pilularia* habitat or associated vegetation types. Also visited were playa habitats at T23S R17E Section 19 (Fig. 4), T23S R18E Section 3, T23S R19E Section 5 and T23S R19E Section 17. In general these habitats were drier than the previously mentioned sites and little playa vegetation was present.

![Figure 1. Button Spring. Light green vegetation is *Ceratocephala testiculatus*.](image-url)
Figure 2. Reservoir at Button Spring

Figure 3. *Psilocarphus brevissimus, Castilleja campestris* and *Plagiobothrys hispidulus* growing at the county line playa. All three species occur in *Pilularia americana* habitat.
Elatine brachysperma

The Potholes site did not receive adequate precipitation to support hydrophytic annuals this season. The site should be revisited during a wetter year as potential habitat for several BLM sensitive plant species is present. Dormant plants of Marsilea vestita (Fig. 5), a member of the same family as Pilularia americana, were common in small depressions throughout Potholes Canyon. The presence of this plant indicates this area is occasionally inundated for extended periods and the margins of these potholes should be capable of supporting E. brachysperma in wetter years.

While visiting Featherbed Lake to conduct monitoring of a known Rorippa columbiae population, the botany crew encountered a small population Elatine brachysperma. Hand lenses with 10x magnification are inadequate to positively identify the species, as the minute pitting on the miniscule seeds is the identifying characteristic. Samples were collected by the BLM and Kelly Amsberry of the Oregon Department of Agriculture Native Plant Conservation Program. A voucher specimen is being curated at the OSU herbarium. This site has been entered into the BLM GeoBOB database.

Positive identification of E. brachysperma was determined in the lab using dissecting scopes to count the number of pits on the seeds and verify the overall length of the seed is 0.5 mm. During the keying process it was also discovered that the Intermountain Flora Vol. 2B key to Elatine only includes three species. Most notably the non-native E. chilensis is absent and any specimens of this species would most
likely key to *E. brachysperma*. Care should be taken if using Hitchcock’s Flora of the Pacific Northwest as *E. chilensis* is also absent from the current edition. The Jepson Manual 2nd Ed. has both species and should be used until the new Flora of Oregon is published.

Figure 5. Dormant *Marsilea vestita* was common in the small depressions scattered throughout the Potholes survey area.

**Allium geyeri var. geyeri**

Examination of the original voucher (V. Crosby #2656) for the site reported in GeoBOB clearly shows the characteristics of variety *tenerum*. Most likely this was entered into GeoBOB as *A. geyeri var. geyeri* because the specimen was only identified to *A. geyeri* and the variety was never determined. An inexperienced botanist can easily be expected to simply attach the generic variety without carefully identifying the material. In this case the generic variety happens to be the BLM sensitive taxon. Since the original report to GeoBOB is based on a local database effort, it is also possible the record was migrated from the herbarium inventory list without any actual examination of the plant specimen. Regardless of why the initial report to GeoBOB was created, it is clear it was based on mis-identification. A duplicate sheet of the voucher specimen is curated at the OSU herbarium and was annotated to *A. geyeri var. tenerum* by D. McNeal in 2006 (Oregon Flora Project Atlas). Additionally, the polygon created in GeoBOB is located in the low sage uplands and not down in the Potholes area as the site comments describe. No *Allium geyeri* specimens of either variety were observed while surveying the Potholes in 2015. Based on the variety ranges and clarification of the identification for our voucher specimen, *A. geyeri var. geyeri* should be removed from the Lakeview Resource Documented/Suspected list.
**Mimulus evanescens - Erythranthe inflatula** (Suksd.) G.L. Nesom

The southern shore of Drew’s Reservoir was surveyed on April 29. Several gravely areas at high water mark may be potential habitat for *Mimulus evanescens*, but with the low water levels in Drew’s Reservoir, suitable hydrological conditions were not present this year. The drainages coming into the south shore support *Mimulus evanescens* populations. These can be expected to provide a seed source for the shoreline habitat when hydrological conditions are appropriate. Reservoir levels will need to be near full stage to supply adequate moisture to appropriate shoreline habitat. The currently exposed shoreline is composed of finer lakebed sediments and is dominated by *Taraxia tanacetifolia* and *Potentilla newberryi*.

**Mimulus latidens - Erythranthe latidens** (Greene) G.L. Nesom

**Documentation**: A single site is documented on the Lakeview Resource Area and is the only documented occurrence for Oregon. The population occupies an ephemeral drainage that feeds into the southeast end of Wool Lake. When discovered in 1984 the population was listed as 200 plants. Subsequent visits in 1985, 1989, and 1991 were unable to re-locate any plants. The habitat was dry in 1985 and 1989, but the report for 1991 mentions that suitable moisture conditions were present and plants were expected to be blooming. Observations from the ORBIC layer document a larger population (approximately 1000 individuals) extending 0.8 mile along the same drainage. This was documented from a reproductive biology study of annual *Mimulus* conducted by Robert Meinke in 1999. Four hundred individuals of *Mimulus evanescens* were also reported in this drainage during the 1999 visit.

No *Mimulus* plants were encountered during the 2015 surveys even though the site did have some inundated areas (Fig. 6). The areas of standing water were limited to the downstream portion of the channel nearest to Wool Lake. The remainder of the channel was dry and did not appear to have seen much water this season (Fig. 7). Given the highly variable population reports, even in years that seemed to have adequate precipitation, it is possible that *Mimulus latidens* requires a very specific temperature and precipitation regime to germinate. It also appears that there is a long-lived seed bank since plants have been observed after absences of several years.
Figure 6. Ephemeral drainage at Wool Lake.

Figure 7. Entrenched drainage in meadow leading to Wool Lake.
Chaenactis xantiana

The location of Crosby #2072 could only be determined to T34S R24E Section 22 and potential habitat occurs throughout this section. Two sheets were collected for this voucher specimen with one remaining in Lakeview and the duplicate sent to OSU. While the Lakeview sheet was identified to C. stevioides, in 1987 Kenton L. Chambers annotated the specimen to C. xantiana. Six years after Crosby’s collection, the area burned in the 1984 Rabbit Fire. The area was seeded to crested wheatgrass and since the voucher had not been accurately identified to a sensitive species at that time, it appears no provisions were enacted to preserve the Chaenactis habitat.

Section 22 was nearly entirely burned and seeded to crested wheatgrass (Fig. 8). Bromus tectorum and Descurainia sophia were the other common species encountered during the 2015 survey. A few isolated unburned patches supported Tetradymia glabrata, Pliecanthus spinosa, Linanthus pungens, and Artemisia tridentata ssp. wyomingensis (Wyoming big sage). Cheatgrass and a few native forbs were common in the interspaces in these unburned areas (Fig. 9).

In addition to searching section 22, surveys were conducted in the adjacent Sections 23, 24, and 27. In Sections 23 and 24 an intact unburned patch of Wyoming big sagebrush occupied a sandy bench. Other associated species in this area included Achnatherum hymenoides, Lupinus brevicaulis, Eatonella nivea, Canbya aurea, Orobanche corymbosa, Phacelia glandulifera, Glyptopleura marginata, Sphaeralcea grossulariaefolia, Descurainia sophia and Descurainia pinnata. Section 27 was largely burned, but several strips of Wyoming big sagebrush survived. Soils were less sandy here. Pascopyrum smithii and Achnatherum thurberianum were present at low levels. Bromus tectorum was common in the shrub interspaces. Diversity and vigor of the forb community at these sites suggest that conditions were appropriate for C. xantiana at the time of surveys. It is possible the crested wheatgrass seedings replaced the Chaenactis habitat. Future survey efforts should focus on intact areas with similar soils. The possibility of re-introduction should also be explored. The site would likely require management to reduce crested wheatgrass and cheatgrass before re-introduction.
Figure 8. Overview of Section 22. Most of the area burned and has been seeded to crested wheatgrass. Minimal native vegetation has re-established.

Figure 9. Native forbs and cheatgrass in shrub interspaces of unburned portions near Section 22.
**Agastache cusickii**

During the pre-survey information gathering, two populations of *Agastache cusickii* were noted to have suspect documentation. The elevation and habitat of the reported sites does not match published descriptions and photos from the site show species that are superficially similar to *A. cusickii*. The May Lake site was a juniper/shrub community at the base of a basalt rim (Fig. 10). Originally reported by an amateur botanist, plants from this site appear to have never been accurately identified. The original photos from the site show specimens of *Monordella odoratissima*. The photos of *Monordella odoratissima* were used for the *A. cusickii* page of the local office field guide to special status plants, further exacerbating future misidentifications. The original reporter was contacted and agrees the reports were based on misidentification. Similarly, the Potholes site has no voucher or photos documenting the presence *A. cusickii*. The photos for this area show plants that appear to be *A. urticifolia* based on the length of the inflorescence and height of the plant stems. This site is not *A. cusickii* habitat and is characterized as a shrub community. The area is a basalt rim with abundant *Ribes cereum, Symphoricarpos oreophilus* and *Amelanchier utahensis* shrubs (Fig. 11).

Site visits in 2015 confirmed that the habitat is not the subalpine rocky scree that *A. cusickii* prefers. *Monordella odoratissima* (Fig. 12) was prevalent at the site near May Lake and specimens of *Agastache urticifolia* (Fig. 13) were observed at the Potholes site. *A. cusickii* should be removed from the Lakeview Resource Area Documented/Suspected list.

![Figure 10. Juniper community at May Lake, a mis-identified *A. cusickii* site.](image-url)
Figure 11. Pothole depression and basalt rim at Potholes survey area.

Figure 12. *Monordella odoratissima* at May Lake site. Note the characteristic bracts subtending the inflorescence.
Figure 13. *Agastache urticifolia* at the Potholes site.
Survey Maps

Pilularia americana Surveys Near Button Springs
*Pilularia americana* Surveys Near Frederick Butte
Chaenactis xantiana Survey Area

Mimulus latidens and Agastache cusickii Survey Areas
Agastache cusickii and Elatine brachysperma Survey Area at Potholes

New Population of Elatine brachysperma Located at Featherbed Lake
Summary review of documentation supporting individual species presence on the Lakeview Resource Area. Each species has further clarification of survey locations, methodology and timing. Plant fact sheets are included for the target species and associated BLM Sensitive Plants that may be encountered.

**Pilularia americana**

2012 ISSSP list status: G5, S2, ORNHIC List 2, SEN, Documented on Klamath Falls and Prineville, Suspected on Medford

**Documentation:** The Oregon Flora Project Atlas shows a 1980 collection located on private land within the Paulina Marsh area north of Silver Lake. There is a parcel of BLM nearby that should be surveyed. There is also a recorded observation from the Button Spring area. Button Spring itself is privately-owned, but the surrounding BLM land may contain suitable habitat for PIAM. The ORBIC layer documents a collection from 1894 by Leiberg. This collection was made from a large alkali flat on the border of Lakeview and Prineville districts. GeoBOB has a documented occurrence on the Prineville District near Hampton, 20 miles east of the proposed Lakeview survey areas.

**Habitat Descriptions:** In shallow water of ponds and temporary pools and on reservoir margins (FNA Vol.2)

**Survey Goals:** Visit the area near Button Springs and the large alkali flat 4 miles north. Survey the BLM parcels adjacent to historic collection sites. Forty-four additional playa and vernal pool habitats were identified on BLM lands in the area east of the documented sites. Survey as many of these sites as possible during a 3-day overnight trip to the area. Leiberg collected a specimen of *Elatine* from the Button Spring area in 1894. Subsequent determinations have identified it to *Elatine chilensis*, a non-native. If *Elatine* specimens are encountered, collections should be made to verify species identification.

**Elatine brachysperma**

2012 ISSSP list status: G5, S1, ORNHIC List 2, OR-SEN, Documented on Burns, Lakeview and Vale, suspected on Prineville

**Documentation:** The ORBIC layer has two mapped populations. The single Lakeview population has the comment “2000 rare plant conference note, Lucile Housley. 2007 pers comm, Lucile Housley (with more precise locality data).” This population is not mapped in GeoBOB. The other population mapped in
ORBIC is on the Vale District and has a GeoBOB record associated with it. The Vale observation was made in 2006 by Don Mansfield, College of Idaho professor. The elevation for the Vale population is similar to the suspected Lakeview site, 5400’ and 5800’ respectively. These populations are included in the Oregon Flora Project Atlas, and a third site is documented north of Bend, OR. The closely related non-native *Elatine chilensis* is documented from 4 locations in Lake County in the Oregon Flora Project Atlas.

**Habitat Descriptions**: Muddy shores, shallow pools (Jepson)

In mud or shallow water on the banks of streams and at the edges of ponds and reservoirs (IM Flora Vol.2B, p.14)

**Survey Goals**: Visit the Lakeview site mapped in ORBIC. Identify any *Elatine* sp. in the field if possible and collect vouchers if population size warrants. Conduct surveys for additional habitat along the Potholes to determine the full extent of *Elatine brachysperma* populations.

### Allium geyeri var. geyeri

2012 ISSSP list status: G4G5, T4, S1 ORNHIC List 2, OR-SEN, “Documented” on Lakeview, suspected in Vale

**Documentation**: GeoBOB site mapped from Lakeview Resource Area TES Flora database located near the Potholes. This likely originated from a local herbarium specimen of *Allium geyeri* (no variety determined, although it is clearly variety *tenerum*, bulbils present) collected from the Potholes in 1982 by V. Crosby (#2656). An additional sheet from this collection is curated at the OSU herbarium and was identified to *A. geyeri var. tenerum* by D. McNeal in 2006. (Oregon Flora Project Atlas)

The ORBIC layer and the Oregon Flora project Atlas both map a single population in northeastern Oregon, with no mention of the supposed Potholes population in either database.

Vascular Plants of the Pacific Northwest and the Flora of North America mentions that while the ranges of both varieties overlap, they do not occur in the same specific areas. Confirmation of the presence of variety *tenerum* and the extreme distance to the nearest known populations of variety *geyeri* would warrant removal of *Allium geyeri var. geyeri* from both documented and suspected for the Lakeview district.

**Habitat Descriptions**: Moist, open slopes, meadows, or stream banks in mountains (FNA Vol. 26, p.237)

**Survey goals**: Visit the area mapped in GeoBOB and survey any additional habitat in the Potholes area. Collect any *Allium* specimens available for confirmation of the variety *tenerum* determination.
**Mimulus evanescens**

*Erythranthe inflata* (Suksd.) G.L. Nesom

2012 ISSSP list status: G2, S2, List 1; OR-SEN, ODA candidate, Documented on Lakeview, Klamath Falls, and Vale, suspected on Burns and Prineville

**Documentation:** The ORBIC layer has several populations located near the BLM parcel on Drew’s Reservoir. These include areas mapped along the shoreline of Drew’s reservoir, Dog Creek, Sagehen Creek, Scotts Cabin Creek and Whiskey Creek. These observations are from Robert Meinke’s annual *Mimulus* study in 1999. This same study identified approximately 400 plants co-occurring with the *Mimulus latidens* population at Wool Lake.

An undated hand drawn map shows a location of *Mimulus evanescens* within the BLM parcel, no other notes are associated with this population.

**Habitat descriptions:** Among rocks and boulders on moist gravel, previously flooded (Jepson)

**Survey goals:** Inventory BLM parcels along the south shore of Drew’s Reservoir for *Mimulus evanescens*, visit nearby populations to verify if plants have emerged this season. Survey for *Mimulus evanescens* while at the *Mimulus latidens* site at Wool Lake.

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**Mimulus latidens**

*Erythranthe latidens* (Greene) G.L. Nesom

2012 ISSSP list status: G4, S1, List 2; OR-SEN, documented on LV

**Documentation:** A single site is documented on the LVRA and is the only documented occurrence for Oregon. The population occupies an ephemeral drainage that feeds into the southeast end of Wool Lake. When discovered in 1984 the population was listed as 200 plants. Subsequent visits in 1985, 1989, and 1991 were unable to re-locate any plants. The habitat was dry in ‘85 and ‘89, but the report for 1991 mentions that suitable moisture conditions were present and plants were expected to be blooming. Observations from the ORBIC layer document a larger population (~1000 individuals) extending 0.8 mile along the same drainage. This was documented from a reproductive biology study of annual *Mimulus* conducted by Robert Meinke in 1999. Four hundred individuals of *Mimulus evanescens* were also reported in this drainage during the 1999 visit.

The range of *M. latidens* is formally described “interior valleys, from Butte and Lake Counties to San Diego County, California; drying mud flats, below 2500 ft” (Munz 1973). The Lakeview BLM population represents a large range extension.

**Habitat Descriptions:** Vernally wet depressions (Jepson)

**Survey Goals:** Survey the length of the swale and inventory any plant populations. Document the condition of previously occupied habitat.
**Chaenactis xantiana**

2012 ISSSP list status: G4G5, S1?, List 2; OR-SEN, Documented on Lakeview, Burns and Vale

**Documentation:** Two historic voucher specimens have been collected on the Lakeview Resource Area. L.E. Detling (#4425) was collected near Adel, OR on May 23, 1940. The label for Detling’s collection only provides the section (T39S R24E Sec. 21). BLM-managed land is not present in this section and much of the area has been converted to agricultural fields and pasture. In 2012, the seasonal botany crew attempted to re-locate this site and surveyed an area south of Adel. According to the report the area has been converted to a crested wheatgrass planting. However, it is unclear why they surveyed that particular area. BLM does manage lands in Sections 20 and 29 that contain suitable potential habitat. There is a mapped soil polygon in these sections that is described as fine sandy loam and likely represents potential habitat.

T. Virginia Crosby (#2072) was collected near the Sunstone Area on June 23, 1978 (T34S R24E Sec.22). Originally designated *Chaenactis steviodes*, the specimen sent to OSU was identified to *Chaenactis xantiana* in 1987 by Kenton L. Chambers (with the additional note, “4 small outer pappus scales”). An additional sheet from this collection is curated at the Lakeview BLM Herbarium (currently still labeled *C. steviodes*).

**Habitat descriptions:** Open, deep, loose sandy (rarely gravelly) soils, arid and semiarid shrublands, chaparral (FNA Vol. 21, p. 410)

Dry, open places, most commonly in sandy soils or about dunes, less often in gravelly soil (IM Flora Vol. 5 p. 119)

**Survey Goals:** Survey T34S R24E Sec. 22 for potential habitat and existing populations. Survey the Mesman soil polygon in T39S R24E Sections 20 and 29. *Malacothrix sonchoides*, another BLM Sensitive Species suspected on our resource area, occupies similar habitat and has been collected concurrently at other locations. Although the nearest documented populations are from the Alvord Basin east of Steens Mountain, surveys for *Chaenactis xantiana* have the potential to encounter *Malacothrix sonchoides*.

**References:**


