Introduction

*Lomatium erythrocarpum* (Meinke and Constance) is a small umbel known from a very small range, about 5 square miles, in the Elkhorns Mountains of northeast Oregon. The plant was first collected in 1982 by Rachel Sines of the Baker Resource Area, Vale District BLM, but its initial assignment to the genus *Cymopterus* hid is unique contribution to Oregon flora. While perusing material deposited in the Baker BLM herbarium, Robert Meinke noted the misidentified *Cymopterus* and returned to the collection site to gather more material. Meinke, with Lincoln Constance, then described the new species, *Lomatium erythrocarpum*, in 1984. *Lomatium erythrocarpum* is ranked G1S1 by Natureserve; is a U.S. Fish and Wildlife Service “species of concern;” is listed “endangered” by the Oregon Department of Agriculture; and is Oregon Natural Heritage Information Center “List 1.” *Lomatium erythrocarpum* is among the rarest plants in Oregon.

*Lomatium erythrocarpum* currently is known from 11 sites across a small range in the Elkhorn Mountains. The plant’s habitat covers thousands of acres in the Elkhorn Mountains; however, only a relatively small portion of this area has been searched. Some 650 acres of this habitat has been searched in past years, resulting in a number of new population discoveries or extensions of existing sites. This project surveyed an additional 311 acres of suitable in areas previously not searched or areas that were recommended by past observers for additional survey.

Habitat

*Lomatium erythrocarpum* grows on exposed sites at high elevations (7500 – 8500 feet) along the Elkhorn crest, mainly on ridge tips, ridge brows and upper slopes. Despite earlier reports that *Lomatium erythrocarpum* occurs on a granodiorite substrate, most sites are situated on a rock type mapped as the Elkhorn Ridge Argillite (Ferns et al. 1987) a weakly metamorphosed sedimentary rock formed from siltstone, shale or claystone. The Elkhorn Ridge Argillite is very common substrate in the southern half of the Elkhorn Mountains covering dozens of square miles. An exception is the one *Lomatium erythrocarpum* site that sits on a limestone outcropping within the argillite matrix. Three sites are located on mapped glacial deposits of cirques, but here the parent material is composed of argillite.
Several sites are positioned on steep talus slopes of glacial cirques and upper slopes, but in these sites the plants grow on small patches of more stable soils amidst the shifting talus. *Lomatium erythrocarpum* is also found growing in rather open stands of whitebark pine (*Pinus albicaulis*) but never under the canopy. Soils are typically very gravelly, sandy loams to gravelly silt loams. Common associated species include *Polygonum phytolaccaefolium*, *Lomatium cusickii*, *Phlox austromontana*, *Phacelia hastata*, *Lupinus caudatus*, *Collomia debilis*, *Castilleja applegatei*, *Trisetum spicatum*, and *Arenaria aculeata*. *Lomatium cusickii* is found at nearly every occurrence of *Lomatium erythrocarpum*, generally in greater abundance.

**Survey Methods**

Seven areas totaling 311 acres were selected for survey (see map set in Appendix). These areas include several recommended for future inventory by Michael Murray in his 2001 report to the Wallowa-Whitman National Forest of the inventory and monitoring for *Lomatium erythrocarpum*. Murray considered slope, aspect and topographic position and vegetation community type in identifying areas of suitable habitat for *Lomatium erythrocarpum*. I selected a few additional areas using similar criteria: substrate, slope, slope position and vegetation patterns derived from aerial photographs and topographic maps.

Inventory was conducted between August 2 and August 9, 2005. See the attached TES Plant Survey Field Form in the Appendices of detailed results for surveyed areas. No new plant populations of *Lomatium* were located.

**Survey Results**

A complete summary of survey results, species lists and habitats encountered can be found in Appendix B on the attached TES Plant Survey Field Form. Below is a brief discussion of results encountered by areas searched.

**Survey Area 001**: Slope northwest of Elkhorn Peak and east of the Twin Lakes. Patches of *Pinus albicaulis/Carex geyeri* Plant Association. Scree and cobble to talus is common on the steeper slopes here. Scree and talus slopes are prevalent here, but searches were concentrated on areas with more stable soils and surfaces. Several species associated with *Lomatium erythrocarpum* were seen: *Lomatium cusickii*, *Polygonum phytolaccaefolium*, *Sitanion hystrix* (*Elymus elymoides*), and *Arenaria aculeata*. However *Lomatium erythrocarpum* was not seen except at a known occurrence (EO#4) that lies about 150 m northeast of the upper Twin Lake. Only ten poorly developed plants – the flowers had all aborted - were counted, where in 2002 approximately 100 plants were tallied.

Robert Meinke first reported this site in 1986 and since then numerous attempts were made by several people to relocate this population, all to no avail. In 2001, Maureen Jones and I located presumably one of the two patches reported by Meinke. This “relocated” site lies between the two sites mapped by Meinke (EO #’s 4, 5) but sits much
closer to EO #5. The description for EO #4 better matches the 2002 rediscovery; in 1986 EO #4 was reported to be the largest *Lomatium erythrocarpum* population, at 20m by 40m and holding some 1900 individuals. It is possible the 2002 rediscovery is a new third patch in this vicinity. The 2002 rediscovery is half this size with around 100 plants, and EO #5 was reported at only 2 square meters with few plants. It seems odd that a patch as large as EO #4 would have gone undetected, despite concerted efforts, for 16 years.

As with most surveyed areas, the presence of mountains goats was easily detectable from tracks, dust wallows, beds and foraged meadows. One prominent set of wallows or beds lies immediately adjacent and downhill from the relocated EO #4 discussed above. As only footprints and a trail were noted inside the *Lomatium erythrocarpum* patch, the reduced numbers observed this year, may be due to other factors, such as the near record low snowpack of 2004-2005.

**Survey Area #'s 2, 3:** Slope on west flank of Elkhorn Peak. This area consists of a steep southwest facing slope supporting a thin cover of *Pinus albicaulis/Carex geyer* plant community throughout much of the area. A fairly heavy cover of *Arenaria aculeata* runs across much of the slope, indicating less potential for *Lomatium erythrocarpum* than aerial photos suggested. Again, searches were concentrated to areas with less plant cover, but *Lomatium erythrocarpum* was not found. The prominent ridge running southeast from the peak, part of the Elkhorn Crest, has been searched in the past for *Lomatium erythrocarpum*, also without success.

**Survey Area #'s 4, 5:** West flank of the ridge southwest of Twin Lakes. Another area of very promising appearing habitat, but *Lomatium erythrocarpum* was not found. Species and habitats encountered are as for survey area #2, above. Again, goat impacts – trampling, and dust wallows, were apparent and locally “severe.”

**Survey Area # 6:** Ridge southeast and slope immediately south by southwest of Rock Creek Butte. This area did not reveal any *Lomatium erythrocarpum*. The SE ridge leading up to the summit of Rock Creek Butte is heavily trailed by both people and wildlife, harboring little plant cover. The slope to the south by southwest of the summit has substantial expanses of shifting talus, and therefore provides little habitat suitable for *Lomatium erythrocarpum*.

**Survey Area #'s 7, 8:** Survey area #8, at Cougar Saddle, harbors one of the earliest discovered patches of *Lomatium erythrocarpum*. This site was revisited, but only a few plants could be observed, where in 1998, ongoing census monitoring tallied several hundred plants. In 2001, Murray counted 130. No apparent impacts from mountain goats were observed other than a small amount of trailing and herbivory (to larger plants). At survey area #7, the slope above Rock Creek Lake yielded no sightings of *Lomatium erythrocarpum*. 
**Discussion**

The 2005 field season may have been a poor year to survey for *Lomatium erythrocarpum* because the 2004-05 winter snowpack was near the recorded historic low. Three known *Lomatium erythrocarpum* sites were visited during the inventory and I could find plants at just two sites. One of these sites (EO #2) appeared to be doing well with numerous fruiting, but the other held only 10 plants (with aborted flowers) where in 2002 approximately 100 were tallied. This seems odd behavior for a perennial plant; however, census monitoring conducted at two sites from 1995 through 2001 shows radical fluctuations in counts of individuals. Counts varied from a high of 1220 in 1998 to a low of 130 in 2001 (Murray 2001). A cursory search in 2005 detected just 3 plants (but I qualify this as not being the thorough grid search conducted during the census counts.) Thus, *Lomatium erythrocarpum* may have exhibited pronounced dormancy in 2005, thereby escaping detection by even the most determined field examiners.

A number of observations this year raised concerns for how mountain goats may be affecting *Lomatium erythrocarpum*. In years past, while some concerns had been raised about the potential for mountain goats to impact *Lomatium erythrocarpum*, no real observation of direct impacts had been observed. There has been an ongoing concern that goats may someday dig wallows in a *Lomatium erythrocarpum* site, but given the relatively low density of wallows and the even lower frequency of *Lomatium erythrocarpum* sites, the probability of this happening seemed remote. With this year’s observations of an apparent increase in the number of wallows, plus the newly discovered wallows immediately adjacent to one *Lomatium erythrocarpum* site, the possibility that mountain goats may dig wallows within a *Lomatium erythrocarpum* site has become more likely.

**Recommendations**

Continue surveys of suitable habitat north of this year’s project area into the granodioritic substrates along the spine of the Elkhorn Crest.

Resume census monitoring where it has been conducted at EO #’s 1 and 2.

Revisit all *Lomatium erythrocarpum* sites and establish photopoint monitoring for the purpose of detecting wallow behavior of mountain goats.
References


*Lomatium erythrocarpum* habitat

*Lomatium erythrocarpum* plant