

Tundra Shootingstar (*Dodecatheon austrofrigidum* K.L. Chambers) Habitat Assessment and Surveys on the Olympic National Forest, WA

Report prepared for the Interagency Special Status / Sensitive Species Program
Cheryl Bartlett, Botanist
October, 2010

Introduction

Tundra shootingstar (*Dodecatheon austrofrigidum* K.L. Chambers), also known as frigid or Tillamook shootingstar, is an herbaceous perennial member of the primrose Family (Primulaceae) (Figure 1a). Individual plants are typically 10 – 45 cm tall, with stout, white roots without bulblets. Caudices are usually present and are +/- vertical and non-woody. Leaves grow in basal rosettes, are ovate to narrowly elliptical, taper gradually to winged petioles, and have entire to denticulate margins. Inflorescences have 1-7 flowers, with magenta to lavender corolla lobes, and a white corolla tube with a purplish, thin, wavy ring. Connectives are smooth and dark purple and the stigma is not enlarged compared to the style. Filaments are distinct. Capsules have thin pliable walls (Reveal, 1997).

Dodecatheon austrofrigidum is found in widely scattered and typically small populations in southwest Washington and northwest Oregon. The majority of the known occurrences are in Clatsop and Tillamook Counties in Oregon, with seven total populations in these Counties. Only two populations are known in Washington state, one in Pacific County, and the other in Grays Harbor, which is in the Colonel Bob Wilderness on the Olympic National Forest. The elevation range for this species is between 200 – 4000 ft (60 – 1200 m) where *D. austrofrigidum* is found in vernal moist places in thin, rocky soils. The Washington populations occur at higher elevations in wet rock crevices and under overhanging cliffs on steep basalt slopes. Habitat in Oregon is more variable, and includes grassy sod over a rocky substrate or on basalt cliffs near streams or waterfalls at higher elevation occurrences, or in rock crevices below the high water line along major rivers at lower elevations (Oregon Flora Project, 2006; WA DNR, 2003).

Because of its' rarity, *D. austrofrigidum* is listed on the Forest Service Region 6 Regional Forester's Sensitive Species List (USDI, 2008) as a sensitive species in Washington and Oregon. Its conservation status is as follows: Global Rank: G2; OR State status: ORNHIC: S2, List 1; WA State Rank: S1; WA State Status: Endangered; Federal Status: Species of Concern. The primary threats identified for this species in Oregon include flooding, damming, and erosion due to timber harvest; no specific threats have been identified for the Washington sites.

Background

D. austrofrigidum has only recently been described in the literature (Chambers, 2006), but had been recognized and listed on Washington's rare plant list as a sp.nov. for many years prior to this official recognition. On the Olympic National Forest, the Colonel Bob population was discovered and recognized as something unique by Ed Alverson in 1983. At the time, he described the small population as keying to *D. dentatum*, except that this new occurrence had magenta flowers, rather than the typical white flowers described for *D. dentatum*. He indicates in a letter dated July 30, 1983 that "the (Colonel Bob) population has the appearance of a distinct taxonomic entity" and that he would "find time ... to search for additional populations", although there is no record of where these surveys may have occurred. Specimens from the Colonel Bob population were eventually sent to Kenton Chambers of Oregon State University, who confirmed that the collection was the taxon that would eventually become known as *D. austrofrigidum*.



Figure 1. a) *Dodecatheon austrofrigidum* growing in a wet rock crevice where a small amount of soil has collected, and b) habitat at the Colonel Bob population on Olympic National Forest; red arrows show approximate location of clumps of this plant on cliff face. The trail to the summit of Mount Colonel Bob is just outside the lower edge of the photo. Photos (June, 2004) provided by Rod Gilbert of RareCare.



The Colonel Bob population was visited and documented by Forest Service Botanist Dorothy Davis on July 6, 1994. A specimen was collected at that time and verified by Nelsa Buckingham, and was later sent to Dr. Chambers. The population was described as consisting of about 15 plants growing in shallow soil pockets that had collected in wet rock crevices on an open but not exposed steep rock face under overhanging cliffs (Figure 1b). A popular trail leading to the summit of Mt. Colonel Bob follows at the base of the cliff where the *D. austrofrigidum* is growing, but does not impose any immediate threat to the

population since the cliff face is too steep and wet for people or most animals to climb or walk on. In 2004 and 2009, volunteers from the RareCare program visited the population to determine if the population could withstand seed being collected. Since the population is so small and access is difficult, no seed has been collected from the Colonel Bob population as of this writing.

Methods

The first objective of this effort was to revisit and assess the Colonel Bob population of *D. austrofrigidum* since it remains the only known occurrence of this species on the Olympic National Forest. It has not been “officially” documented by Forest Service personnel since the 1994 visit by D. Davis, although it has been monitored by various people over the years. A second, equally important objective was to survey for additional populations of this species on the Olympic National Forest since appropriate habitat, although scattered and isolated, is common on the Forest.

The Colonel Bob population was visited July 21, 2010, not only to assess this occurrence, but to also get a search image for the plant and the habitat it is currently known to occupy on the Forest. Surveys for additional populations were conducted after this visit in the Upper Humptulips watershed and the Three Peaks Botanical Area in the Upper Wynoochee watershed. These surveys occurred in August and early September, 2011 and approximately 70 acres were examined. After these surveys were completed, areas suggested for future surveys were identified using aerial photos (Figures 2, 3, and 4). Decisions regarding where these future surveys should take place were based on the knowledge and familiarity with these areas gained through the completion of these surveys, and on conversations with several people familiar with this species. Habitats targeted for surveys included not only the wet cliff face habitat of the Colonel Bob population, but also rocky stream, waterfall and pond edges, and wet meadow habitat.

Results and Discussion

The Colonel Bob population was found to be in good health, with 11 clumps of plants observed. Only one plant was seen in flower, and three with fruit, although it was difficult to determine if these were produced from the present years' flowers, or from the previous year. All but a few of the plants were out of reach on the cliff face and were consequently observed with binoculars. All of the plants with evidence of sexual reproduction were in wetter microsites, while the vegetative plants were seen growing in locations that represented the full moisture spectrum observed – from barely moist to very wet. The trail does not appear to be having a detrimental effect on this population – most plants are well out of reach from the trail, and the wet, seepy cliff would be a difficult and dangerous climb for both people and animals. One potential threat that does exist is climate change. If snow packs are consistently reduced, or the surrounding vegetation changes to the point of altering the moisture regime of this location, habitat suitable for *D. austrofrigidum* at this location could shrink or be lost altogether. This site should be visited– yearly if possible - to monitor the population and determine if change is occurring. Efforts should also be made to collect limited amount of seed, although only a tiny amount (perhaps only a couple of flowers-worth per plant) should be collected in any single year, and only in years where there are numerous flowers on several different individuals. There are several areas nearby that should be targeted for future surveys (Figure 2), but access may be extremely difficult.

No new populations of *D. austrofrigidum* were discovered during the course of these surveys, although appropriate habitat was relatively common in the areas searched. The area in the Three Peaks Botanical area north of the 2270 road at milepost 16 (Figure 3) had many areas where habitat similar to the Colonel Bob population was common. In particular, there are several small canyons leading up towards the Olympic National Park boundary that had abundant wet cliff faces, many with grassy sod over talus at their base (Figure 5). This area, more than any other surveyed, seems to have good potential to support additional populations of *D. austrofrigidum* and should be a priority for future surveys.

Figure 2: Colonel Bob Wilderness Tundra Shootingstar Surveys

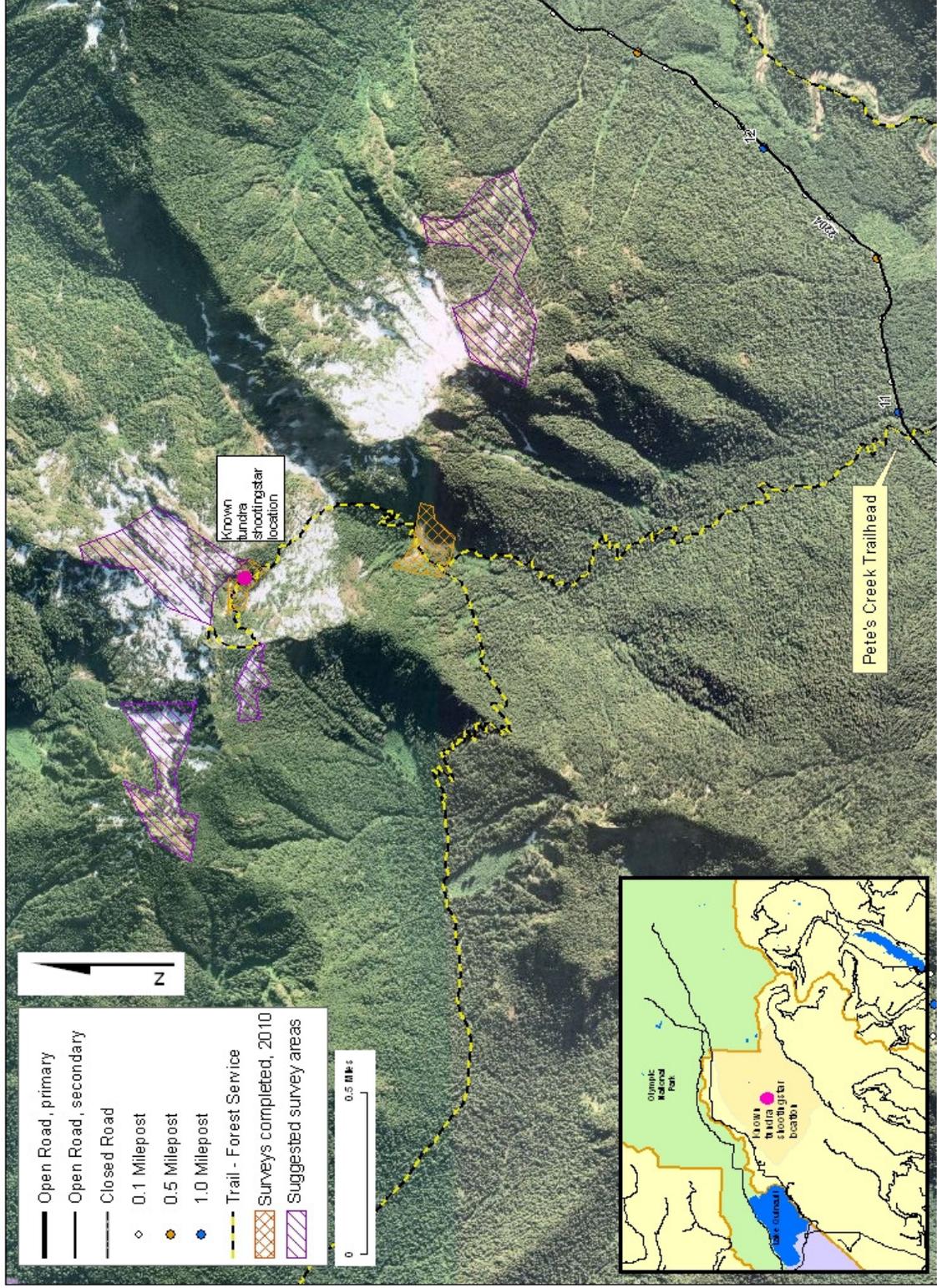


Figure 3: Three Peaks Botanical Area Tundra Shootingstar Surveys

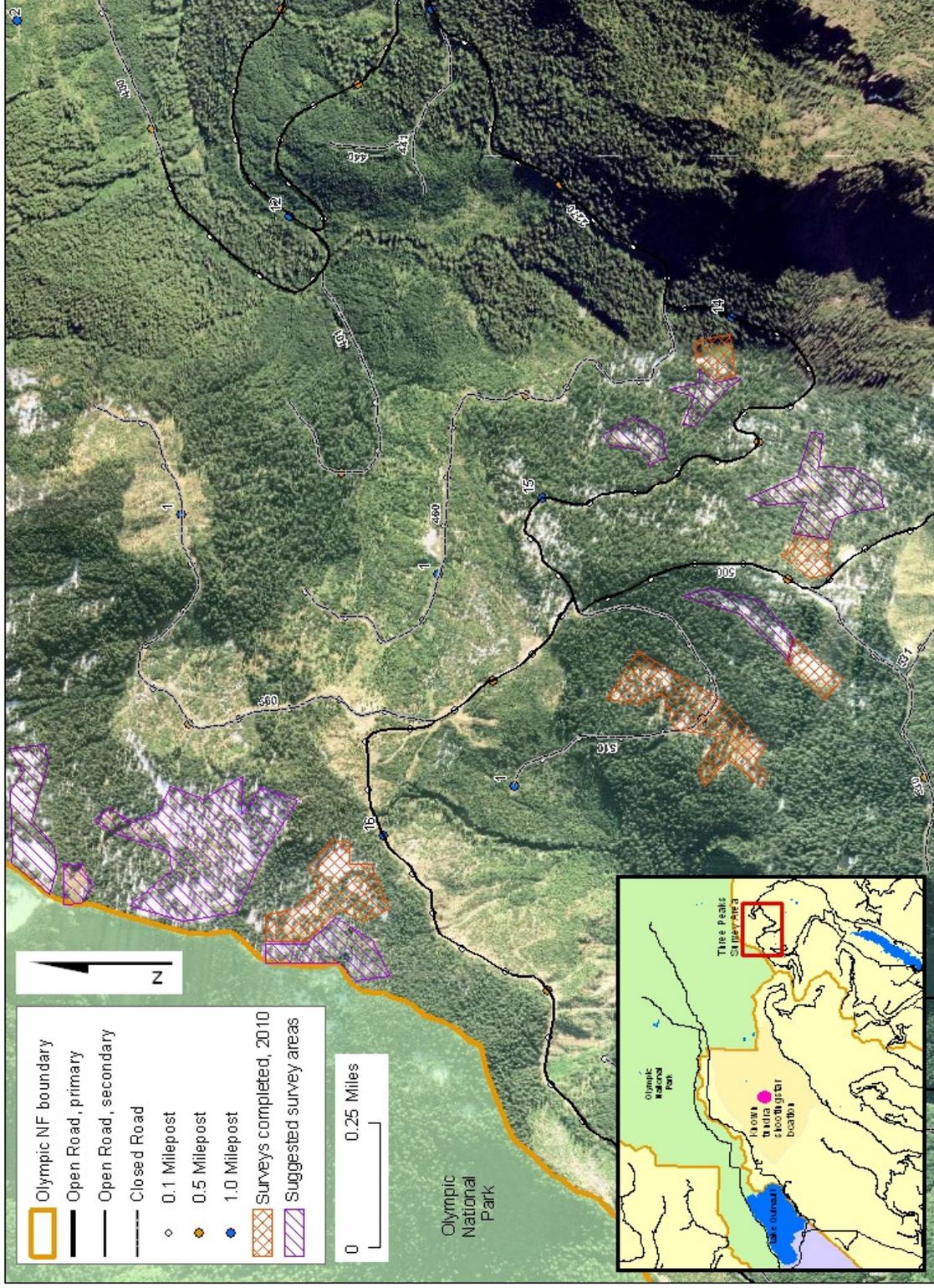
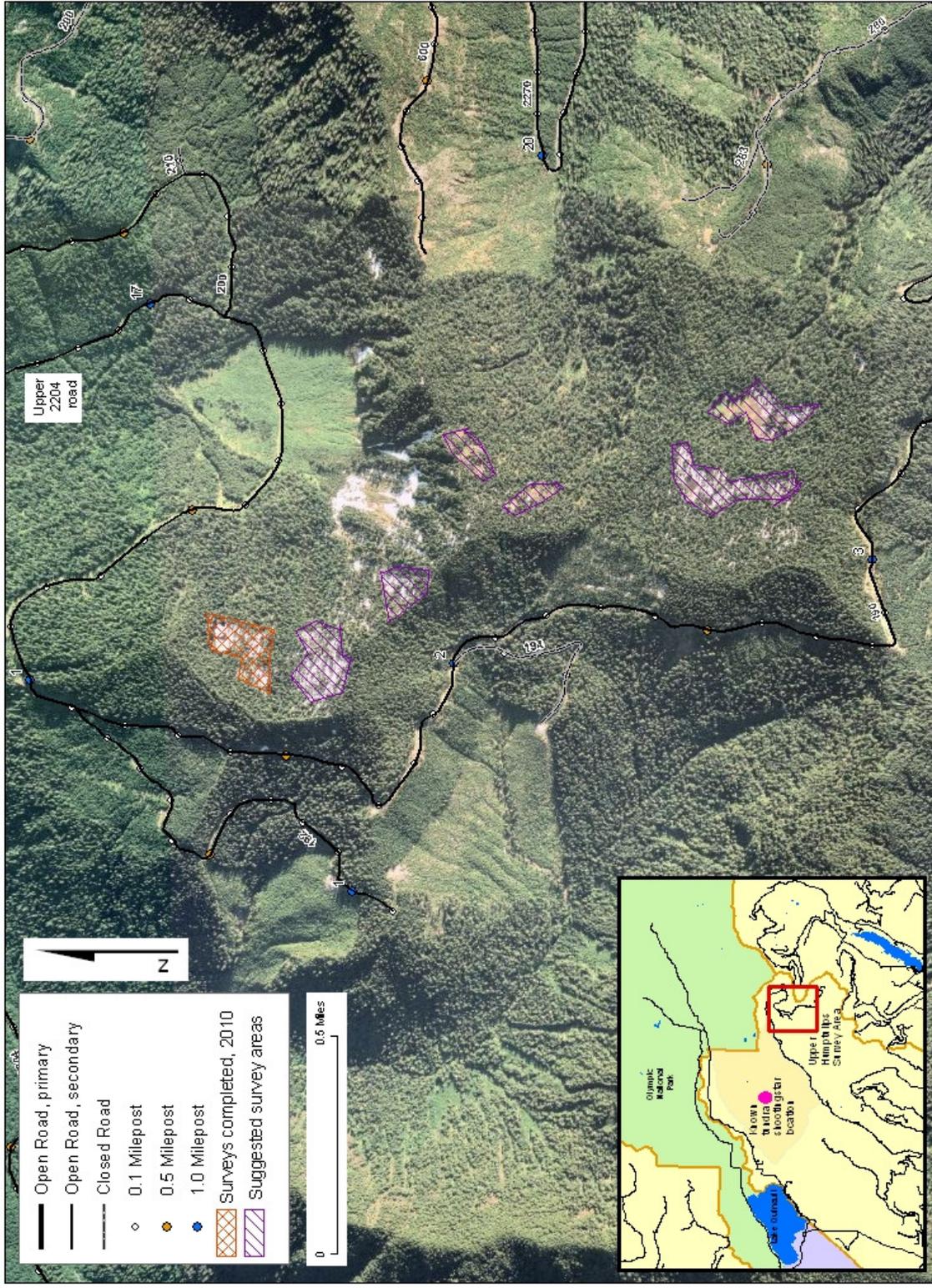


Figure 4: Upper Humptulips Area Tundra Shootingstar Surveys



Other habitat types surveyed in and around the Three Peaks Botanical Area included pond and stream edges and wet meadows. Although *D. austrofrigidum* was not found in the areas searched, it seems that much of the habitat surveyed could support this species. Future surveys for *D. austrofrigidum* should include additional wet meadow sites in this area since wet rock faces were often found to be associated with this type of habitat. *Dodecatheon jeffreyi* was common in wet habitats at scattered locations within the areas surveyed in and around the Three Peaks Botanical Area.

In the Upper Humptulips drainage, a wetland associated with a small pond (Figure 4) was surveyed on July 28, 2010 by Deborah McConnell, a Biological Science Technician on the Olympic National Forest. The area around the edges of the pond consisted of a dense stand of sedges and various herbaceous perennials, including *Dodecatheon hendersonii*. Several other small openings to the south of the pond and on the northeast facing slope in the West Fork Humptulips watershed could also be examined in the future, but it seems likely that any occurrences of *D. austrofrigidum* that might exist there would have already been discovered, since this area has been surveyed for sensitive species in previous years. Other openings at the headwaters of both the Wynoochee and East Fork Humptulips Rivers seem to be better candidates for future surveys.

Figure 5. Area northwest of milepost 16.0 of the 2270 road near the Olympic National Park boundary. Appropriate habitat for *D. austrofrigidum* is common here, and future surveys in this area are highly recommended.



References

- Chambers, Kenton L. 2006. A new species of *Dodecatheon* (Primulaceae) from the northern coast range of Oregon and Washington. *SIDA* 22(1): 461-467.
- Oregon Flora Project. 2006. *Dodecatheon austrofrigidum* K.L. Chambers. Oregon State University. Available: <http://www.oregonflora.org/rarepdfs/dodaus.pdf>
- Reveal, J.L. 1997. *Dodecatheon*. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 16+ vols. New York and Oxford. Vol. 8, pp. 268, 278. Available at:
Dodecatheon key: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=110733
(Accessed 7/29/2010)
Dodecatheon austrofrigidum species description:
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250092213 (Accessed 7/29/2010)
- Washington State Department of Natural Resources. 2003. *Dodecatheon austrofrigidum* Chambers. Washington DNR Natural Heritage Program. Available:
<http://www1.dnr.wa.gov/nhp/refdesk/fguide/pdf/dodaus.pdf>
- USDI. 2008. State Directors Special Status Species List – Sensitive Vascular Plants. USDI Bureau of Land Management – Oregon and Washington. June 2008.