

Follow-up Survey of Peck's Penstemon at Trout Creek Conservation Area

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Introduction

It is commonly believed among conservationists that as extinction rates continue to increase, we will lose most of the species that are currently classified as threatened over the next several decades resulting in extinction rates that are up to ten times higher than we have now (Pimm, 1995). This means that we may lose up to a third of the planet's remaining species over the next several decades and as we lose species, we decrease biodiversity which is detrimental to the remaining habitats and to the remaining organisms including humans (Freeman, 2002). Deciding which species to focus protection efforts on is difficult; as the number of rare species targeted for protection increases, more land is needed to protect them, and this can quickly use up conservation resources (Reyers, 1999). By the same token, rare species can be used to protect larger areas that would not normally receive conservation efforts. Also, according to Pimm the destruction of habitats that specifically contain endemic species is responsible for the existing extinction rates. Consequently our lack of knowledge regarding endemics is hindering our ability to protect biodiversity (Pimm, 1995).

The Forest Service has made a decision to protect a rare and threatened plant *Penstemon peckii* which is endemic to about 485 square miles in Central Oregon with

98% of its population occurring on lands managed by the Forest Service. One location containing approximately 10% of this population exists on a conservation easement called Trout Creek Conservation Area (TCCA) (Pajutee, 2005). Censusing this plant at (TCCA) will help us to decide how local disturbances are affecting it, what the population dynamics may be, and whether the population is self-sustaining (Sutherland, 1996).

Peck's Penstemon has a particular set of requirements for its life history, one of which is an open habitat for seed germination, plant vigor, and flowering (Pajutee, 2005). In the spring of 2003 an opportunity arose to thin trees in the Trout Creek Conservation Area, so a baseline census of *P. peckii* was taken by Karen Allen and Bill Mitchell before the thinning was done (Pajutee, 2005). This study is the follow-up census of *P. peckii* in the TCCA done by students from the University of Oregon's restoration ecology field study class. In particular, we wanted to find out how Peck's Penstemon has responded in the wake of fuel-reduction thinning of the Ponderosa pine canopy at this site.

Methods

Total population of Peck's penstemon plants were counted along the intermittent Trout Creek channel on the Trout Creek Conservation Area. The channel was surveyed for plants along with approximately fifty feet to the north and south by the University of Oregon ecological restoration field study class. This survey included and was guided by Karen Allen who conducted the survey done in 2003.

Because *P. peckii* plants often have multiple crowns, a single penstemon plant was defined as one having no more than 6 inches of space between the separate crowns. All plants were counted as well as how many flowering stems were present on each.

Diameter was taken in even increments beginning with 2 inches. Teams worked from opposite ends of the channel toward each other and flagging was tied at the place where the teams intersected. This point was not at the midpoint of the channel, but was closer to the East end. Each team's data was noted as being collected from the East or West side of the intersection flagging. Flower color was also noted if present. The data were then compared as a whole to the census done in 2003.

Results

The 2006 Peck's penstemon census counted a total of 1109 plants as compared to the 580 plants found in the 2003 census. In 2006 the number of flowering stems decreased to 784 from 874 flowering stems from 2003. The percentage of plants with flowering stems dropped from about 50% in 2003 to about 30% in 2006. Total plant diameter increased from ~2577 inches in 2003 to ~5328 in 2006. Most flowers were pink. In the 2006 census, a significantly higher number of the population was composed of plants in the smallest size category (Table 1).

Table 1. Plants grouped by smallest size class vs. all others in 2003 and 2006. In the second census, a significantly higher percentage of the population was composed of plants in the smallest size category.

*[Chi square = 7.2, df = 1, p < 0.01]

Diameter	2003	2006
≤ 2 inches	129	314
> 2 inches	452	797

Discussion

The data collected in 2006 showed an almost twofold increase in number of Peck's penstemon as well as over twice the total diameter. However, the percentage of penstemon plants with flowers decreased considerably. This could simply be a reflection of a higher percentage of young plants as a result of higher recent seed germination (Table 1). The opening of the canopy from the thinning would have substantially increased the amount of sunlight to the seeds which was stated as being one of the limiting factors for Peck's penstemon (Field, 1985). Further data analysis and/or studies could compare the age classes within each year's population to determine whether the population was young or old and whether older plants tended to have more flowering stems. Another important detail to investigate is whether the month in which the census was taken has an effect on the number of young plants. In particular, the 2003 survey was conducted in August and the 2006 survey in June, so there is a possibility that some young plants are lost during the heat of the summer.

An additional observation that may cause concern and initiate new research was the observation of an unidentified larva on many of the mature buds and young flowers. The flowers on these plants were partially damaged and further study would be needed to determine whether seed production was affected.

In conclusion, it appears that the conservation strategy that the forest service developed has been maintained during the thinning in the Trout Creek Conservation Area as no habitat was lost and the *P. Peckii* population did not decrease (Pajutee, 2005).

Factors other than increased sunlight from canopy thinning which may have accounted for our 2006 results are as follows: (1) higher springtime precipitation; (2)

increased number of observers could have led to a more thorough survey of region especially outside of the stream channel; (3) the 6 inch criterion between crowns didn't exist in first survey which could have led to either a more or less conservative count.

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