

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

United States
Department of
Agriculture

Forest
Service

Wenatchee National
Forest

Leavenworth Ranger R.D.
600 Sherbourne
Leavenworth, WA 98826-1299
509-548-6977

Date: May, 1994

Reply to: 2670

REPORT:

**The Rhizome Morphology and Sensitivity to Ground Disturbance of
*Cypripedium fasciculatum***

Richy J. Harrod, District Plant Ecologist

Introduction

Cypripedium fasciculatum is a rare terrestrial orchid found in a few scattered locations throughout several western states. Populations are relatively abundant on the Leavenworth Ranger District compared to other known locations; about 25 populations have been located to date. In an attempt to better understand aspects of the species life history, an individual clump of plants was excavated to determine if the species was rhizomatous. The following discussion is the result of this excavation.

Results and Discussion

In the fall of 1993, we determined that *C. fasciculatum* was rhizomatous by excavating the duff and an about 3-5 cm of soil away from a cluster of aerial stems. We were careful to only remove soil about 1 cm below the main rhizome and we worked diligently. The plant we examined showed four apparently dormant underground shoots, one adjacent and distal to the stem of each current aerial stem. The subterranean shoots were turgid, although the current years growth was already withering. These shoots

ranged from 1.8 cm to 2.5 cm long. The entire rhizome was relatively shallow, and removing the duff layer nearly exposed the structure. Also, we noted that the shoots had a strong, musty odor, similar to that of the fresh flowers.

Each stem and shoot pair was attached to the distal end of a woody rhizome branch with numerous stem scars. Each shoot corresponded to an adventitious root growing down from the ventral side of the rhizome branch. Individual aerial stem scars along the branch corresponded to individual roots, many of which were apparently senescent.

Based on the above observations, I hypothesize that this species produces a dormant bud during the current years growing season. This bud remains inactive through the winter, but then bolts in April to produce an aerial stem. At the same time, a new bud is initiated and developed during the photosynthetic period. If my assumptions are correct, then it would be possible to age plants by counting the number of adventitious roots or corresponding stem scars. The plant we excavated would, therefore, have been 25 to 30 years old.

These observations have led to a series of questions. Is there a correlation between stand age and *C. fasciculatum* age? Is there a correlation between the size and robustness of individuals and their age? Are large, robust individuals the result of having large, robust rhizomes? Or, are they correlated with young rhizomes? Or, do plants increase in size with the increasing age or the rhizome? Do plants diminish in size with age, or do they increase for a time, then decrease?

However, it may be impossible for us to answer some or all of these questions. Upon my return to the excavation site in early May of this year, I could find no aerial

stems and inspection of the rhizome revealed a rotting rhizome and dormant buds. We had thought that we were as careful as possible in our excavation and had returned the soil and duff to its original position. The woody rhizome and tough adventitious roots appeared, at the time, to easily withstand our investigation. Fortunately, I had chosen a population of nearly 125 stems.

This apparent sensitivity to ground disturbance is significant and something we all must keep in mind when we are planning projects in areas where this species occurs. Buffer areas established in timber sale areas must be sufficiently large enough so that if a tree were accidentally to fall in the buffer, it would not fall on the plants then dragged over the plants. Other types of ground disturbance should probably be avoided given that the buds for next year's growth is largely found in the duff layer.