

RESEARCH ABSTRACT

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Study Title: Demography of *Lupinus lepidus* on the pumice plain and its role in primary and secondary succession.

Key Words: terrestrial plant herbs succession ecosystem
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Abstract: This study details the demography of two populations of *Lupinus lepidus*, a primary successional plant species growing on the Pumice Plain, and also investigates the role lupine plays in the recruitment of additional species through facilitation. Lupine and other plant species' populations have been censused once or twice each growing season from 1982-1991. Prairie lupine was the first species to colonize the barren deposits of the Pumice Plain and attained extremely high densities in certain portions of our plots during the census years.

Lupine population size, density, and age classes varied considerably through time and appeared to be associated to summer temperatures and precipitation. In one plot, from a population of about eight individuals in 1982, lupine numbers expanded to about 1000 during 1983 and 1984, then burgeoned to 21,923 plants in 1985. This was followed by a sharp decline through density dependent mortality in 1986 to 5,903 individuals. From 1987 through 1991 lupine numbers have slowly declined with population sizes ranging between 1,000 and 4,000 individuals. Following the high mortality of 1986, numerous wind dispersed weedy species have colonized the sites where lupine had ameliorated the harsh growing conditions of the site. By 1991, thirty-one species were present on the plot. Once established these early successional forbs and grasses have expanded through sexual and vegetative reproduction and have become dominant features of the plant community. Bryophytes have become very conspicuous components of the flora during 1990 and 1991.

Type of Measurement(s): Plants were identified to species and individuals were measured and mapped to the nearest centimeter. Flowering and fruiting phenologies were recorded and the presence of phytophagous insects noted, particularly aphids and beetle larvae.

Frequency of Measurement(s): Lupine and other plant species were censused once or twice annually from 1982-1991.

Data Storage: Data are stored on original data sheets, floppy diskettes and on magnetic tapes at Utah State University and at Mount St. Helens National Volcanic Monument Headquarters.

Long-term plans: Data available for collaborative efforts: Plans are to continue monitoring the plant populations growing within these plots into the next century. Collaborative efforts will be considered on a case specific basis.