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Study Title: Development of vegetation on barren and high elevation sites.

Key Words: terrestrial plant upland herbs graminoids
primary succession ashfall zone lahar pyroclastic flows
turnover heterogeneity relicts archives subalpine

Abstract: This study is a continuation of work begun in 1980. Current studies include monitoring permanent plots, monitoring grids, studying relict plots, assessing vegetation in potholes, and describing vegetation along transects. The plots studied to date can be divided into those that are fully recovered, those undergoing secondary succession and those undergoing primary succession. The rate of recovery, measured by the number of species and their cover, is related to proximity to sources of colonists and to habitat stress. The species composition of sites undergoing primary succession is related to proximity to intact vegetation and is strongly affected by distance and by chance effects. Previous studies have demonstrated that environmental factors only weakly predict species composition. Continuing studies have demonstrated that relict sites do not contribute significantly to the invasion of late successional species, but do serve as nurseries for species adapted to the adjacent barren plots. Continuing studies have shown that the vegetation becomes less heterogeneous over time, but that variation due to dispersal affects is not overcome by plant development. Continuing studies have demonstrated support for the carousel model of vegetation assembly in that the local (<.25 square meter) extinction colonization rates are high in all types of plots. Studies during 1998 will focus on: resampling permanent plots on tephra at Butte Camp, on lahars at Butte Camp, on scours at Pine Creek Ridge, on Pumice at Abraham Plain and Pumice Plain, and on Studebaker and Toutle Ridges. Grids will be resampled at Butte Camp, Abraham Plain. We plan to sample transects along the Muddy River, local scale transects at each major to determine species relationships to microsites and to each other, and resample newly formed wetlands.

Study Locations: The location of each study site is on file with the monument. Here is a summary:

T9N	R5E	Sec. 27.	Pumice Plain permanent plots and grids.
T8N	R5E	Sec. 1 and 2.	Abraham Plain permanent plots and grids.
T8N	R5E	Sec. 11.	Pine Creek Ridge permanent plots.
T9N	R5E	Sec. 29, 32, 33.	Studebaker Ridge
T8N	R5E	Sec. 12, 13, 18.	Butte Camp plots.
T8N	R6E	Sec. 12, 13, 18.	Muddy River studies.

Type of Measurement(s): Non-destructive estimates of cover and frequency of shrubs, herbs and mosses.

Frequency of Measurements(s): Annual in most cases.

Data Storage: Disk (spread sheet and textes), hard copy, original field notes.

Long-term plans: Data available for collaborative efforts. Continue studies for at least five years. Data are available for collaborative efforts upon specific request and formal agreement.