

Revegetation Investigation

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The recovery of disturbed areas in the tundra environment has received much attention at Rocky Mountain NP, where strong mountain winds are an important factor in the process of revegetation. We have begun related work on the colonization of wind-de-stabilized flood deposits in an upper montane environment just a short distance below the tundra . . . an

opportunity that arose as a consequence of the Lawn Lake Flood.

When the dam containing Lawn Lake failed, about 986,400 m³ of water descended a mountain valley for 7.3 km with an average fall of 99.6 m in each kilometer. At the base of this valley an extensive outwash fan was deposited. Because the energy of the flood waters decreased rapidly with the abrupt reduction in slope, large boulders were deposited at the beginning of the fan while fine sands were deposited much farther downstream. Stream channel modification and the burial of the vegetation are two important consequences of this major flood.

Our study of the outwash is focused on four sites which range in stability from very little wind-related surface change to continuous deposition and shifting of wind-transported material. The revegetation rates differ greatly among these surfaces – the number of species and cover of vegetation are over 2.5 times greater on the most stable site compared with the others. Thirty-five species have become established among all of the sites after one full growing season. While 25 of these occur on the most stable site, only three are present where stability is least. Even greater disparities exist among density values. Available moisture, nutrient status, and proximity to a seed source are factors that can influence revegetation at these sites. However, the destabilizing effect of wind is clearly the most important factor at this time. Colonization and establishment have been greatly impeded where the outwash is subject to continuous microsite adjustment as particles are shifted by the wind.

A potential impact that might alter the rate and direction of succession is trampling by park visitors. The outwash fan is popular with visitors and readily accessible from the road. Although trampling is not a serious problem now, management of human impacts might be necessary if succession is to proceed unimpeded. On the other hand, the small extent of these unstable sites provides them with a scarcity value as a type of environmental surface. These early successional stages could be prolonged on the most unstable sites as part of a management strategy to maintain the current interpretive opportunities for future park visitors. It is evident that, on unsheltered sites in the upper montane, the erosive and destabilizing effects of the wind can be as great as in the tundra environment.

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