

Introduction

Quaking aspens (*Populus tremuloides*) are the most widely distributed tree species in North America. They typically grow at moderate to high altitudes and prefer cool, moist regions with access to water. In Oregon, they are mostly distributed east of the Cascade Mountain Range. They are easily recognizable for their papery white bark and their leaves that tremble in the wind. Healthy aspen stands create habitat for wildlife. Young aspen are high quality forage for livestock, deer, and elk, especially where access to grasses is limited. The purpose of restorative action is to increase and analyze the growth of the quaking aspen populations, since they are vital for wildlife and overall forest ecology. The actions of fencing, conifer removal, and controlled burns are potential management techniques to help restore the quaking aspens.

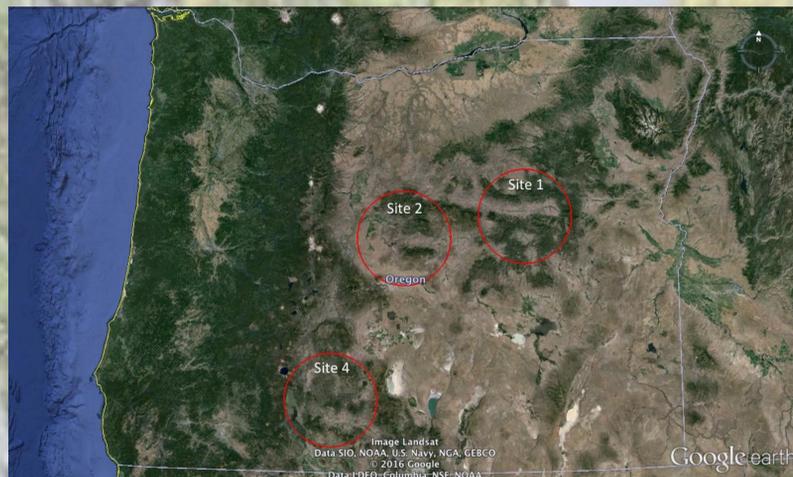


Figure 1. Map of restoration sites monitored before (2008) and after (2015) restoration.

About Us

The University of Oregon Environmental Leadership Program (ELP) is a service-learning program that is designed to allow students to collaborate with community partners in addressing environmental issues. Aspen Adventures and other field-based monitoring projects within the ELP help students develop data collection skills in the field, as well as learn how to write and present scientific research in a professional setting.



Figure 3. Sprout count along transect



Figure 3. Population count in circle plot

Methods

Data was collected in September 2008 and 2015 using methods outlined in the Land Manager's Guide to Aspen Management in Oregon. We counted aspen sprouts within 3 feet of either side of two 75 foot transect lines (Figure 2). We also counted aspen stems within two 23.6 foot diameter circle plots, with stems classified in 3 height categories (Figure 3). Photos were taken from the center point of each stand as well as from a point outside each stand to capture qualitative data.

Our analysis was focused on the effects of conifer removal and stand fencing on sprout regeneration.

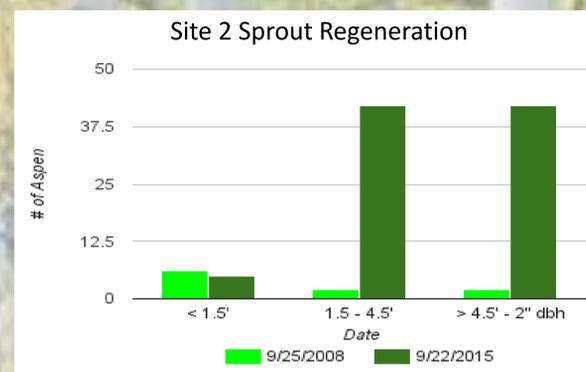


Figure 4. Site 2 sprout regeneration for 2008 and 2015

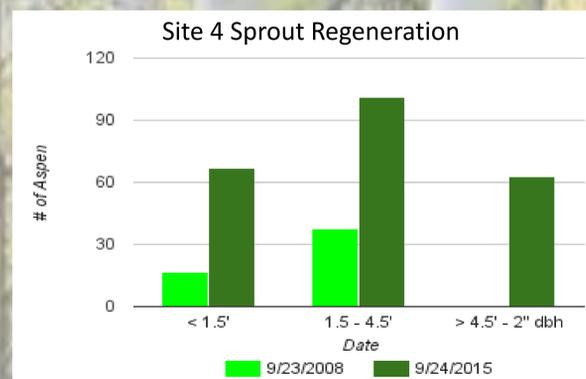


Figure 5. Site 4 sprout regeneration for 2008 and 2015

Results

We found an increase in sprout regeneration from 2008 to 2015 for both Site 2 and 4, as shown in Figures 4 and 5.

Conifer removal is evident in Figure 6, as well as aspen sprout regeneration in the background of the photo. Similarly, conifer removal can be seen in Figure 7. However, increased damage is also visible.

For Site 2, the overall browse level changed from moderate to light from 2008 to 2015. At Site 4, the browse level changed overall from light/moderate to moderate/severe from 2008 to 2015. Site 1, as seen in Figure 1, contains partial data from 2008, making the results unclear for that site.



Figure 6. Site 2 photo points: 9/25/2008 (left) and 9/22/2015 (right)



Figure 7. Site 4 photo points: 9/23/2008 (left) and 9/24/2015 (right)

Discussion

More browse damage was found at Site 4 than at Site 2, potentially caused by lack of fencing at Site 4. Recent drought and different habitat types also influence damage at sites. However, our monitoring showed that both sites experienced an overall increase in sprout regeneration post-treatment (Figures 4 and 5).

A striking difference in the Site 4 photo comparison (Figure 4) is the color of the grass and the aspen leaves. The lighter colored leaves in 2015 indicate a drought environment.

The photos additionally show the impact of conifer removal. Both sites show removal of conifer in the background from 2008 to 2015. The 2015 Site 4 photo shows aspen regeneration in the background (Figure 4). Site 2 has fewer aspen sprouts in both 2008 and 2015 than Site 4 (Figures 4 and 5). Several conifer sprouts are visible in the foreground, indicating a need for continued conifer removal.

Management Recommendations

Through the analysis of sites from 2008 – 2015, the use of fencing and conifer removal benefited the regeneration of quaking aspen. We recommend buck and pole or barbed wire fencing of a height greater than 65 inches to keep ungulates out so they can't browse and trample the sprouts. We recommend conifer removal within each site to help quaking aspen regenerate since they are shade intolerant, as well as creating space for the quaking aspens to expand. In some cases, a controlled, low intensity burn may be beneficial in maintaining the health of a stand, but this method should be researched before taking any action.