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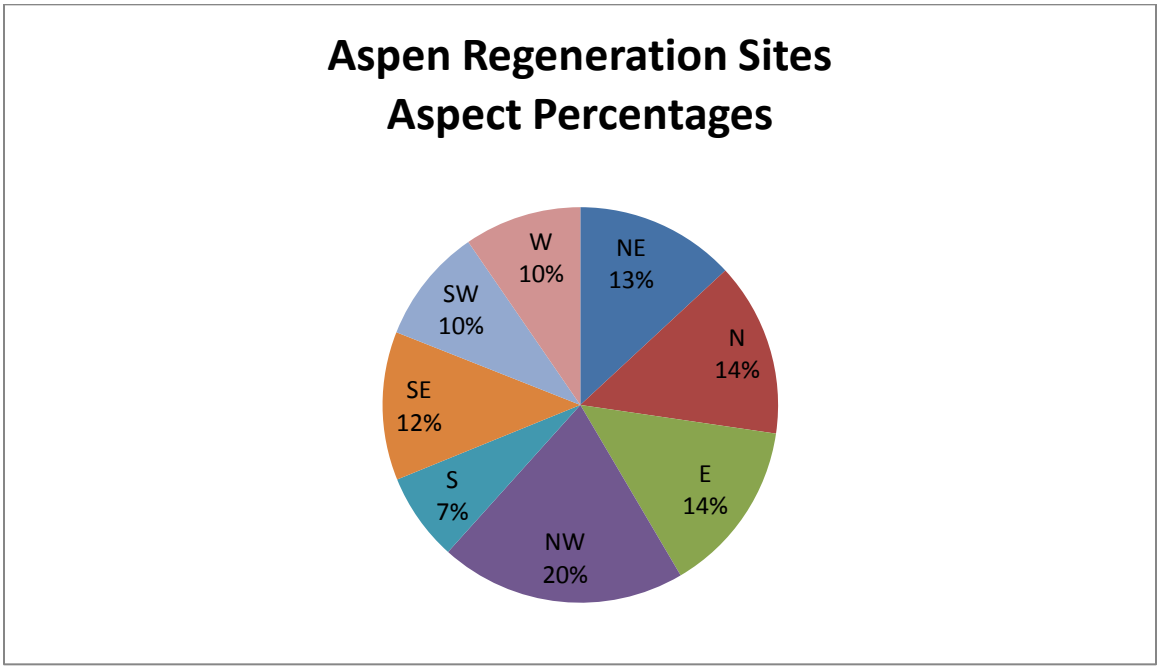
January 21, 2010

Aspen Regeneration after 2000 Fires on the Bitterroot
Tim Benedict

Introduction

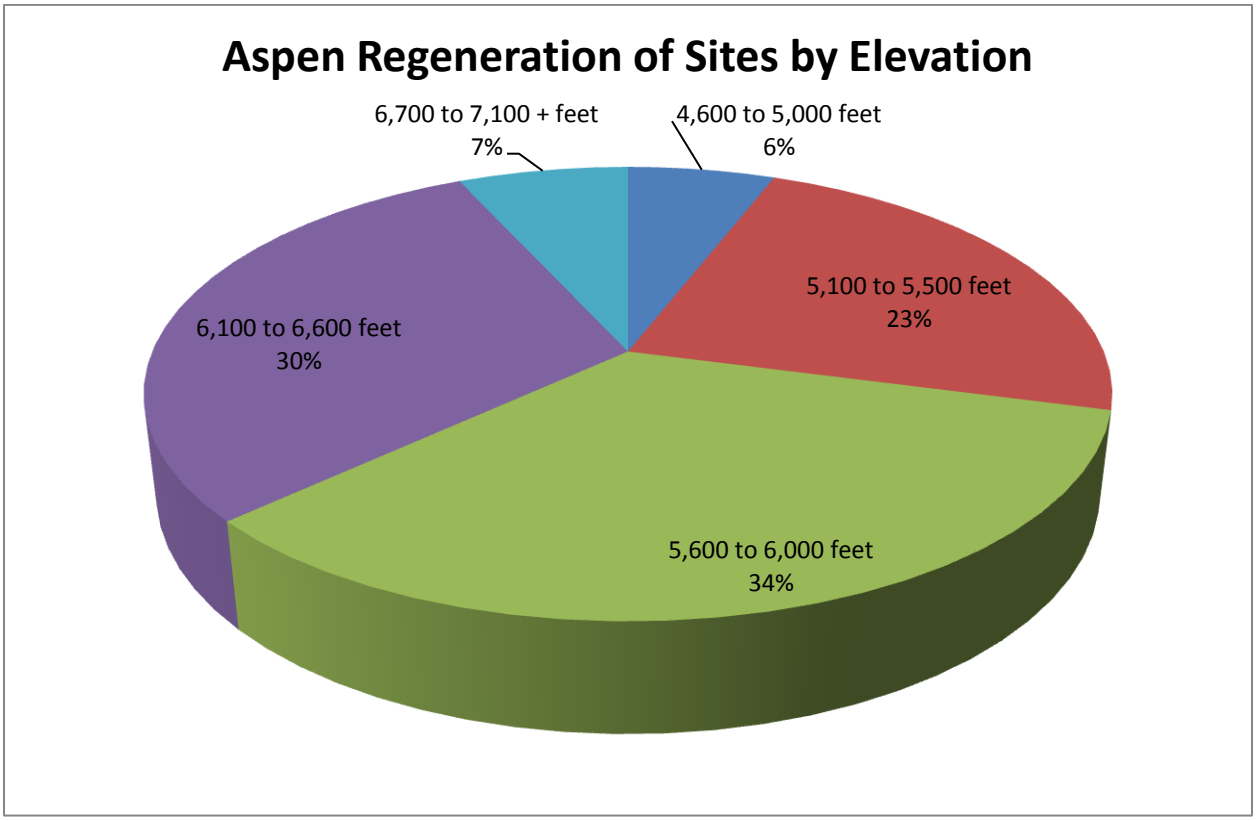
I engaged in a mission to search aspen regeneration response in Montana following large scale disturbance events, such as wildland fire. The Bitterroot surfaced as a prime example. Sue Macmeeken, former Bitterroot Silviculturist, expressed "The Bitterroot is not known for having a lot of aspen. Before the 2000 fires we saw it sporadically across the landscape in draws, openings, and a few other areas - mostly as individual trees and once in awhile as a small grove. After the fires, it came up all over the place and in fairly large numbers. It seemed impossible that it could be due to sprouting alone although no one spent a lot of time digging them to check their origin. It was not everywhere but it was so common that no one took notice anymore. There is so much of it that it appears that there's plenty for the deer & elk to munch on and we really didn't notice it disappearing anywhere. "

Jack Cornelisse, Bitterroot National Forest Silviculture and GIS Specialist, mapped (Appendix 1) the majority, 96%, where an aspen component of seedlings and saplings are found on approximately 25,740 acres and 653 stands. These sites vary primarily from 200 to 400 stems/acre from generated data. This data comprises a mixture of plot examinations and walk throughs found in the FACTS data base. In an effort to search to extract trends that might aid in future management, I reviewed data specific to aspect and elevations. What follows is the result.



The overall breakout of sites by aspect showed the majority of sites regenerating from fire disturbance had a north or east aspect influence. The majority of sites were found on northwest (NW) aspects, approximately 20%. Looking at sites with aspects of NW, E, N, NE and SE, the percentage totals approximately 73%. These aspects are where the majority of aspen regeneration resides. A good probability would be due to moister sites. Aspect is not a limiting factor to regeneration. Perhaps,

other reasons such as dry season, elk or domestic livestock need further evaluation to analyze what impacts or influences they may have on regeneration.



Fires will spread as influenced by topography, fuels and weather. These natural unplanned ignitions on the Bitterroot happened when all specific conditions (especially hot dry conditions) listed were in alignment. Given the randomness of these fires, mainly in 2000, the trend shows the majority of aspen seedlings and saplings are in an elevation range of 5,600 to 6,000 feet, approximately 34% of the sites. If you look at the elevation ranges above and below it shows an additional 53% of these sites. Aspen responds to disturbance and when aspen is disturbed, elevation for the most part does not limit its suckering ability.

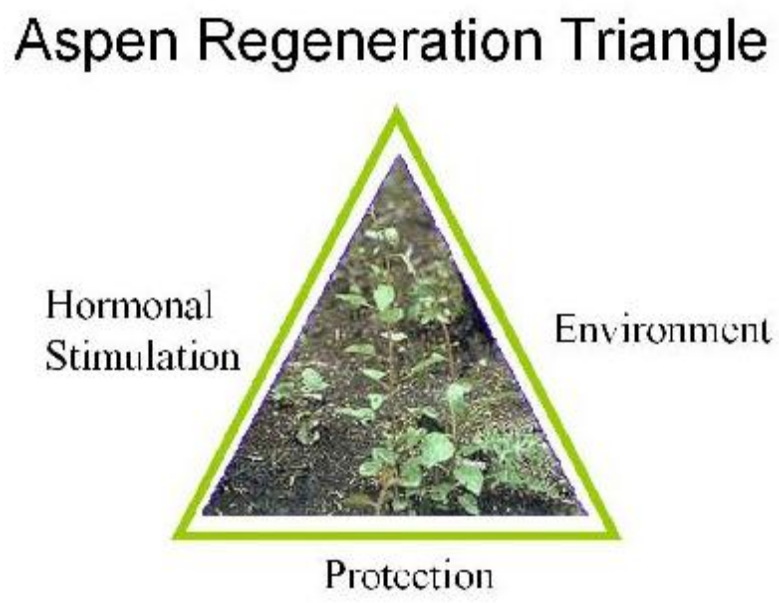


Figure 1. The aspen regeneration triangle model (Shepperd 2004)

Aspen responds to disturbance and the Wayne Shepperd triangle describes elements of aspen regeneration best. The aspen regeneration triangle (Shepperd 2001, 2004, Shepperd et al. 2006) serves as a decision model to identify factors needed to successfully regenerate aspen by isolating the need to stimulate sprouting, provide growing conditions conducive to aspen, and protect sprouts once they occur (Fig. 1).
These factors must be in place for aspen regeneration to occur and this is demonstrated on the Bitterroot thus far.

When there is a robust response to suckering occurring amid a large landscape, such as a fire disturbance, it enables aspen regeneration with some mortality/damage from elk and domestic livestock but continuing growth. Perhaps, further research or investigation would help in understanding the changing dynamics of aspen in Montana.

The main hormonal stimulation is disturbance and large fires appear the best way to favor aspen regeneration on a large landscape. Such is the case for the Bitterroot not noted for its aspen.

Further Research

Based upon further peer review a number of questions have been brought up as to the future of these aspen?

- Because trees/acre are relatively low should we measure number of clumps with sprouts/clump?

- Are conifers present?
- Are they pure groves, or scattered individual trees?
- Is there evidence of animal damage on surviving stems?
- Does this data reflect established trees (undamaged saplings), or damaged and suppressed seedlings still susceptible to herbivory?
- Is there any evidence of additional suckering (younger sprouts) around these trees.

Answering these questions would be helpful to find if aspen will persist on the Bitterroot.

Literature Cited

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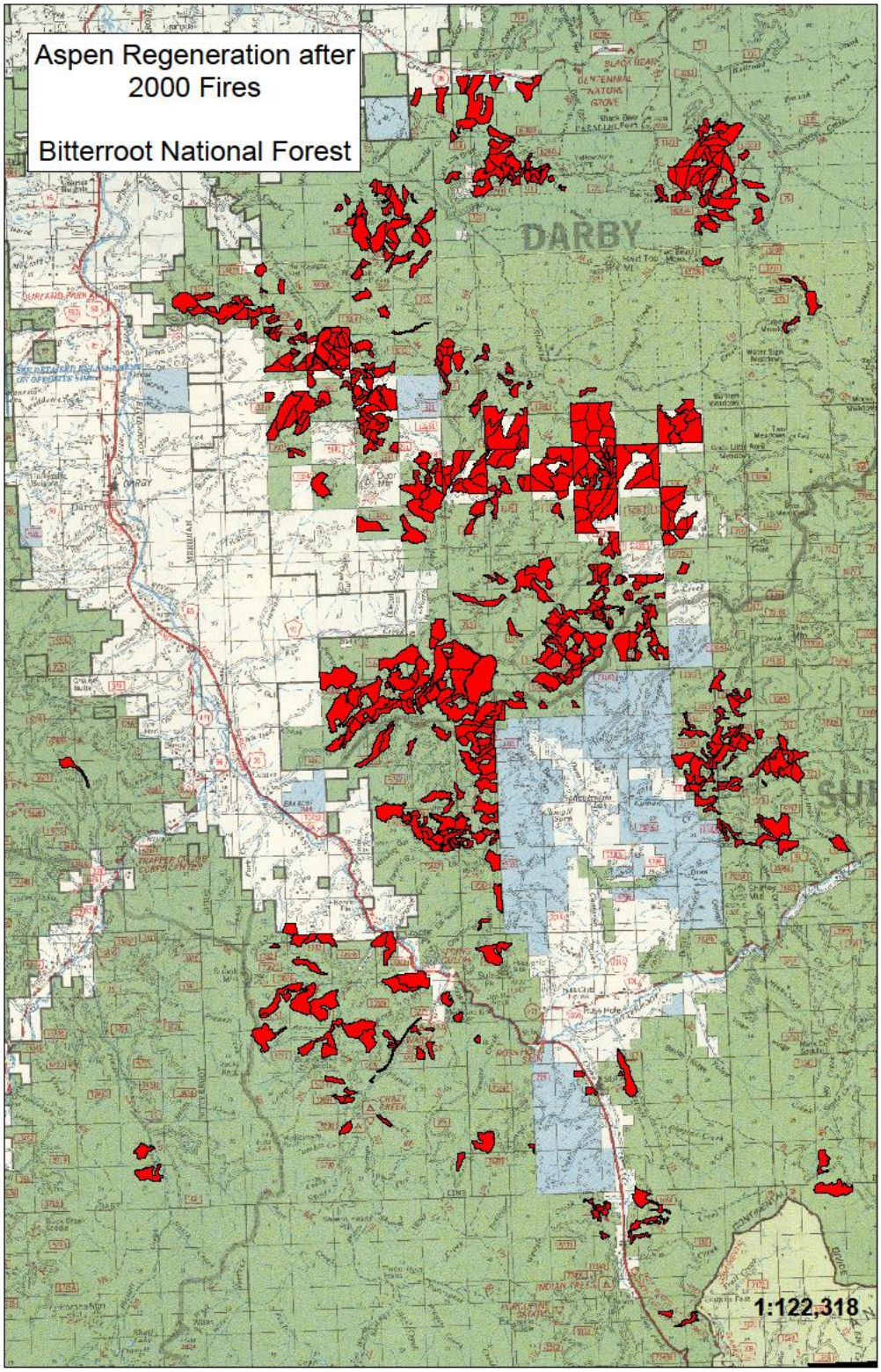
Appendix 1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