

Developing an Aspen Conservation Plan **Centennial Valley Fire Learning Network Aspen Workshop Summary** **September 2006**

The Centennial Valley Fire Learning Network (FLN) organized a workshop focused on aspen ecology and management September 21-22, 2006 at Elk Lake Resort to address the complicated issues surrounding this important habitat type in the Greater Yellowstone Ecosystem (GYE) and develop an approach specifically for the Centennial landscape. Twenty people attended the workshop, representing public land management agencies, state wildlife agencies, research institutions and conservation organizations. Decline in aspen canopy cover in the area was the common management concern that brought the group together. The Centennial Valley FLN is one of ten regional fire learning networks across the U.S. that is focused on collaborative restoration of landscape-scale fire-adapted ecosystems. For background information about the Centennial or information about other regional networks, please visit http://tncfire.org/training_usfln_CVfln.htm.



Aspen and Douglas-fir stands east of Elk Lake

Workshop Highlights **Ecology Session**

Presentations provided a context for our discussions, addressed the aspen ecology in the region, and defined key threats to aspen. Andy Hansen began by describing the dramatic changes in land use and ever expanding human effects in the GYE. Human encroachment into aspen affects the functional area of aspen habitat, alters ecological processes, most notably fire, and results in associated declines in biodiversity due to species-area effects. In addition to the reduction in functional area, actual loss of aspen cover has also occurred across the GYE, although the change varies depending on biophysical site conditions (see Brown et al. 2006, *Landscape Ecology* 21:933-951). In some areas, like the Centennial, aspen canopy cover has declined substantially, while aspen has changed little across other portions of its range.

Bill Romme made a key distinction between declines in canopy cover and the more irreversible decline in aspen clones. The latter is more dire because, when an entire root system of a clone dies, the probability of recolonization is low and the habitat is essentially lost. This is important to consider when planning restoration actions such as prescribed burning which can make clones more vulnerable to ungulate browsing and may even lead to extirpation of a clone. This has been documented in several locations in the West. The important drivers of decline in aspen cover are conifer invasion, fire exclusion and browsing. The most important driver of extirpation of clones though is chronic, intense browsing. The complicated interactions of treatments (i.e. prescribed fire, mechanical conifer removal, etc.), wildfire, browsing, and climate suggest that managers should expect surprises and use an adaptive management approach.

Aly Piwovar, who attended the “Restoring the West” conference in Logan, Utah the previous week, shared some of the highlights of the conference. Aspen die-off, which refers the rapid death of a previously robust aspen clone, has been documented in Colorado but the causes remain unknown. Similar die-off is thought to be occurring in Montana as well. A presentation by a geneticist at Utah State University suggests that the genetics of aspen are more complicated than previously thought, with tremendous diversity even across small areas and more sexual reproduction than expected. This genetic diversity may have an important influence on browsing.



Unburned aspen stand within the Winslow Fire

Richard Keigley presented three methodologies for assessing the effects of browsing on aspen: browse architecture, the live-dead (LD) index of intensely browsed plants, and reconstructing the browse history of plants. The browse history and growth rate analysis are the most intensive methods and can distinguish the effects of browsing, climate, vigor and stem age. A field assessment of aspen was undertaken across the range of aspen in the Centennial and it included measurements for using the LD Index along with other relatively easy

measures of forest composition, recent stand history and aspen regeneration. Of 488 randomly selected points within the elevational range of aspen (6800-8200 feet) that had been sampled at the time of the workshop, 111 had either live or dead aspen and of those approximately two-thirds were dominated by conifers. Initial results suggest that elk browsing is ubiquitous across the landscape and is suppressing aspen recruitment. The final results of this assessment will have important implications for aspen management in the Centennial Valley. For example, if the 8000 acres of potential aspen habitat that burned in the Winslow Fire is not enough to disperse the effect of elk, then the prescribed fires planned for the area that are smaller are unlikely to reduce elk effects.

Our final discussion concerning what a “healthy” or “restored” aspen stand looks like revealed that the important scale for evaluating this is not the stand-scale but across the landscape. There is no reason to expect all aspen stands across the landscape to be the

same with recruitment of young trees and a multi-age stand; but it is reasonable to expect these conditions across some portion of the landscape (i.e. a mosaic of aspen supporting a wide range of conditions). The dramatic decline in aspen cover was of substantial concern to all participants because the desired landscape-scale characteristic of at least some recruiting stands (i.e. net loss but some gains) do not appear present based on preliminary results of the field assessment. Restoring the critical process of fire was considered important, but only when the more immediate effects of browsing have been addressed.

Management Session

We began with a summary of stressors to aspen which we ranked using TNC's Conservation Action Planning (CAP) methodology. Immediate stresses include habitat destruction, conifer competition, inadequate recruitment, rubbing and gnawing of bark, removal of leaves, altered composition (i.e. weeds) and the interaction of conifers and browsing. Because the complicated interactions of these factors seem more important than any singular factor, ranking within CAP was difficult and unrealistic. Participants agreed that browsing was the most important issue to address in aspen management. Although replacement of aspen by conifers is a major concern over a large portion of the landscape, this vegetation change cannot be successfully addressed without first solving the problem of widespread and chronic, intense browsing by wild ungulate populations. Aspen has persisted with the influence of moose and elk for millennia, but changes in habitat use, expanding human influence, removal of predators, and ever increasing concentrations of these animals in secure locations like the Centennial Valley may be changing this relationship.

Jodie Canfield presented a case study of restoration efforts in small aspen stands across the Elkhorn Mountains. The treatments were only successful with elk exclosure fences and varied depending on treatment (i.e. prescribed fire and mechanical removal of conifers). Although mortality was not always directly related to browsing, browsing often weakened sprouts and made them vulnerable to disease and infection. The cost of restoration per stand was generally high especially relative to the small size of stands. Canfield recommended slowly moving in the right direction by mechanically removing conifers without burning to preserve overstory aspen and snags.

The group discussed several key management actions as well as some adaptive, long-term approaches to managing aspen in the Centennial Valley.

- Analyze data from 2006 field inventory to determine patterns in regeneration and browse effects, especially for the Winslow Burn area, which represents an experimental opportunity;
- Engage all relevant partners and stakeholders in collaborative planning and management efforts with special attention to wildlife biologists who can help with understanding elk and moose use of aspen, timing, etc.;
- Build several reference exclosures to isolate the effects of browse on aspen recruitment from effects of climate, fire, wolves, site conditions, etc. (priority in Winslow Burn);
- Discuss options for helping FWP's hunting quota for elk be met for the 2006 season, perhaps through an extended season;

- Develop adaptive management framework for management decisions with defined goals and triggers for changes in management (see Bill Romme’s preliminary outline on the ftp site);
- Build the Centennial Valley as a case study for aspen (and willow?) restoration through adaptive management of sustainable wildlife habitat; and
- Identify areas within the Winslow Burn area where recruitment is occurring (i.e. vigorous growth and little browsing are resulting in tall regenerating sprouts).

Field Trip into the Winslow Burn of 2003

After nearly two days of concentrated discussion about the widespread, chronic browsing of regenerating aspen in the area affected by the Winslow fire, the first stand the group encountered within the burn exceeded 2 meters in height and demonstrated the potential growth possible in the absence of browsing. Ungulates may have avoided this stand due to its proximity to the road although it had experienced severe browsing pressure before the fire. In the interior of the burned forest, nearly all the regenerating aspen was suppressed by ungulate browsing (elk scat was abundant), an observation consistent with the preliminary results of the field assessment. The exception appeared to be along the grassland ecotone where earthflow deposits formed benches with apparently deeper soils (maybe mollisols). The vigor in these stands was impressive and may be the result of a number of factors. It was suggested that sites with vigorous growth be inventoried along the ecotone to determine if there is a pattern.



For More Information

Please visit the Centennial Valley FLN website

http://tncfire.org/training_usfln_CVfln.htm to download a copy of the participant list and agenda, and for up-to-date information about upcoming workshops.

For other information please contact Nathan Korb at nkorb@tnc.org or 406-925-1144.

The Centennial Valley Fire Learning Network is part of a larger cooperative project of The Nature Conservancy, the USDA Forest Service, and the Dept. of the Interior called *Restoring Fire Adapted Ecosystems (RFAE)*. In addition to learning networks, the project has fire education and training components. The goal of the RFAE project is to work at local to national levels to overcome barriers to implementing ecologically appropriate fuels reduction and restoration projects.