TREMBLINGS

NEWSLETTER & BULLETIN BOARD

Vol. 3(1), February 2012

"…partnering to preserve and restore healthy aspen ecosystems."

NOTICE: The WAA is a user-driven organization. *Tremblings* will attempt to capture the greater aspen user group's wants and needs. Please send news items and announcements, contributions, **recent reports & publications**, photos, and commentary ideas to Paul Rogers (p.rogers@usu.edu). We encourage you to share *Tremblings* with your friends and colleagues!

WAA HAPPENINGS

WAA Reaches new landmark—As of February 2, 2012 there are now 100 U.S. Forest Service members. With the most aspen forest cover of any land management agency in the U.S., this should come as no surprise. This strong level of participation confirms a commitment by Forest Service employees throughout the agency (as well as all members) to stay abreast of aspen science to better perform their jobs. Thanks for your support!

Rangeland Society Hosts Aspen Session—The Society for Range Management (SRM) hosted a special session titled, "Aspen Ecology and Management" in Spokane, WA in early February. This session was organized by Eva Strand (U. of Idaho) and Dale Bartos (USFS, Research). Topics included aspen research history, grazing in aspen, National Park monitoring, several genetics-related discussions, and status of the WAA. Participants eagerly snatched up all our information and technical publications and we saw a jump in membership coinciding with this event. We hope to post links to presentations soon….stay tuned for details. Contact Eva Strand for the status of this effort: evas@uidaho.edu.

Wallow Fire Aspen Recovery Team Meets—U.S. Forest Service, Arizona Fish & Game, and sportsman's group representatives met with Dale Bartos and Paul Rogers (WAA) via conference call January 13th. Key issues included post-fire monitoring of aspen regeneration following the 2011 "Wallow Fire" in eastern Arizona. Large wildfires represent opportunities for aspen community rejuvenation where browsing can be properly managed. Previous fires in the area have also produced successful aspen seedlings—thereby expanding the regional gene pool—a critical, though rarely documented, function after large aspen disturbance. Further information on this group and upcoming activities can be obtained from Linda White-Trifaro (lwhitetrifaro@fs.fed.us) Apache-Sitgreaves National Forest.

*Aspen surrounding a lone subalpine fir (*Abies lasiocarpa*) in Logan Canyon's upper reaches. (Photo: Paul Rogers, Wasatch-Cache-Uinta National Forest, Utah, USA).*

UPCOMING EVENTS

BLM Webinar Open to All—The Bureau of Land Management (BLM), WAA, and Utah State

Western Aspen Alliance

TREMBLINGS

NEWSLETTER & BULLETIN BOARD

Vol. 3(1), February 2012

University Forestry Extension will be hosting an interactive "webinar" (2.5 hour web seminar) February 22, from 10:00 a.m. - 12:30 p.m. Mountain Standard Time. Key discussion items will be aspen functional types, ungulate herbivory, and BLM management in aspen forests. This webinar targets BLM Field Office Natural Resource Specialists and Managers and will allow for input, comments and questions after the presentations. Procedures for non-BLM employees logging on to the webinar can be found at: https://connect.usu.edu/aspen2012/. **It is recommended you log on at least 15 minutes prior to the webinar to test settings and your connection to the system**.

COMMENTARY

Facilitation in aspen-conifer forests

Samuel St. Clair, Assistant Professor of Plant Physiological Ecology, Brigham Young University, Utah

Across its expansive range, quaking aspen commonly associates with conifers to form mixed forests. The composition and function of these forests is largely defined by the positive and negative interactions between aspen and conifer species. During mid- to late- successional stages the competitive advantages of conifer species promotes their expansion and dominance. However, conifer's competitive advantage is balanced by reinvigoration of aspen following disturbance driven mortality of conifers.

Recent studies demonstrate that conifer seedlings can be highly dependent on the presence of aspen for successful establishment, a phenomenon in ecology known as facilitation. Long standing observations show that conifers establish abundantly under young aspen stands during the early stages of succession (Fig. 1a) and more recently we've discovered that conifer seedlings tend to aggregate at base of aspen trees (Fig. 1b). The successful establishment of conifer seedlings at the base of aspen trees is most likely driven by a combination of greater water availability at the base of aspen trees and the presence of shade particularly on the north side of aspen trees (young conifer seedlings are sensitive to high light). Ironically, conifer establishment under mature conifer trees tends to be limited by the poor water relations that exist under conifer canopies. Proximity, as a result of facilitation, can create antagonistic interactions in later life stages as young conifer seedlings mature and increasingly compete for soil and light resources. We found that close proximity of maturing conifer trees and the aspen trees that facilitated their establishment, drastically increased aspen mortality while promoting the survival of conifers.

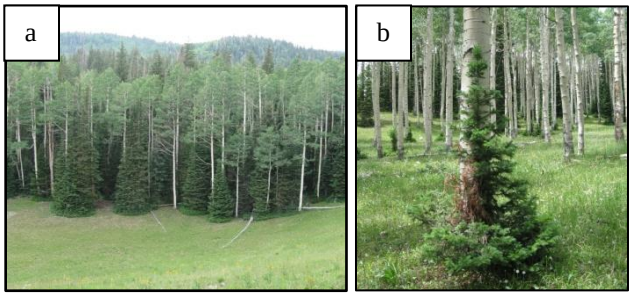

Figure 1: *(a) young subalpine fir trees developing under an established aspen stand next to aspen trees while no seedling regeneration is occurring in the adjacent meadow in the foreground; (b) subalpine fir saplings in the foreground and smaller seedlings in the background have established right next to mature aspen trees but are absent in the interspaces (Photos: Samuel St. Clair).*

These finding have important implications for the management of aspen forests. The maintenance of natural disturbance regimes appears crucial in striking an ecological balance between facilitative and competitive interactions that promote sustainable mixed aspen-conifer forests. Because of aspen's primary role in initiating secondary succession through post-disturbance sucker regeneration, and the subsequent dependence of conifers on aspen for establishment, aspen mortality via competition with conifers under longer fire

TREMBLINGS
NEWSLETTER & BULLETIN BOARD
Vol. 3(1), February 2012

cycles, droughts, or intensive ungulate browsing may result in a loss of aspen-conifer forest communities in some locales. This is especially true in the Interior West of the U.S., because aspen regeneration is largely an asexual process that depends on suckering from living root systems. We have observed several instances where intensive elk grazing of regenerating aspen suckers following disturbance have resulted in complete aspen mortality. Fifteen years later these areas that were once thriving mixed aspen-fir forests are now grasslands with no evidence of aspen or conifer regeneration.

Fire can be used as a management tool for maintaining balance in competitive interactions between aspen and conifer, but regenerating aspen suckers are much more susceptible to herbivory than the mature stands they replace. Thus, in areas with high browse pressure, management steps need to be taken to control intense browsing of aspen suckers by wildlife and livestock.

RECENT ASPEN PUBLICATIONS

Anderegg, W.R.L.; Berry, J.A. Smith, D.D.; Sperry, J.S.; Anderegg, L.D.L.; Field, C.B. 2012. The roles of hydraulic and carbon stress in a widespread climate-induced forest die-off. *PNAS*, 109(1): 233-237.

Buma, B.; Wessmann, C.A. 2012. Differential species responses to compounded perturbations and implications for landscape heterogeneity and resilience. *Forest Ecology and Management*, 266: 25-33.

Korb, J.E.; Fulé, P.Z.; Stoddard, M.T. 2012. Forest restoration in a surface fire-dependent ecosystem: an example from a mixed conifer forest, southwestern Colorado, USA. *Forest Ecology and Management*, 269:10-18.

Martin, T.E.; Maron, J.L. 2012. Climate impacts on bird and plant communities from altered animal-plant interactions. *Nature Climate Change*, doi:10.1038/nclimate1348.

Pinno, B.D.; Landhäusser, S.M; MacKenzie, M.D.; Quideau, S.A.; Chow, P.S. 2012. Trembling aspen seedling establishment, growth and response to fertilization on contrasting soils used in oil sands reclamation. *Canadian Journal of Soil Science*, 92:(1) 143-151.

Solarik, K.A.; Volney, W.J.A.; Lieffers, Victor J.; Spence, J.R.; Hamann, A. 2012. Factors affecting white spruce and aspen survival after partial harvest. *J. of Applied Ecology*, 49: 145-154.

White, M.A. 2012. Long-term effects of deer browsing: Composition, structure and productivity in a northeastern Minnesota old-growth forest. *Forest Ecology and Management*, 269:22-2-228.

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