



TREMBLINGS

NEWSLETTER & BULLETIN BOARD

Vol. 7(2), May 2016

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

NOTICE: The WAA is a user-driven organization. Please send news items and announcements, contributions, **recent reports & publications**, photos, and commentary ideas or rebuttals to Paul Rogers, Director/Editor: p.rogers@usu.edu. We encourage you to share *Tremblings* with your friends and colleagues. **New members welcome!**

WAA HAPPENINGS

500 Strong!—The WAA reached a landmark 500 members during April, 2016. Since the beginning of this science-based organization in 2008, we've averaged about 62 new members per year from a wide range of agencies, organizations, academic institutions, and citizens. Our 500th member was Ashley Wells from the BLM Dillon Field Office, Montana. Ashley received a complete bound copy of the 2013 Special Issue of *Forest Ecology & Management* (Vol. 299) consisting of 10 review articles addressing different aspects of contemporary aspen science and stewardship. Congratulations Ashley, and thanks to all our members for supporting progressive aspen science and management through the WAA!

Like the WAA on Facebook—For those tuned in to Facebook this is an excellent way to get updates, see intriguing photos, and join the discussion regarding aspen in the West. We're [now on FB](#), so pass it on!

Collaborative Restoration Workshop—If you missed the April 26-27 Collaborative Restoration Workshop in Denver, video and slideshow archives are available at the [conference website](#). The conference featured breakout sessions on Science, Monitoring, Planning, and Climate Futures, as well as plenary presentations by USFS Chief Tom Tidwell and Undersecretary of Agriculture for Natural Resources Robert Bonnie. The conference of over 3000 participants was organized by the National

Forest Foundation, and sponsored by several NGOs, corporations, and academic institutions.



Native American legend suggests that aspen "eyes" watch over the people; overseeing young hunters, while also imparting morality to their everyday deeds as they traverse the mountains. As we monitor Pando in central Utah, pictured above, is the giant clone watching us, too? (Photo: Paul Rogers).

UPCOMING EVENTS

The WAA in Scandinavia—WAA Director Paul Rogers will be visiting Sweden, Finland, and Denmark in late May/early June, giving presentations at Swedish University of Agriculture (Umeå) and University of Helsinki. Paul will be discussing fire, herbivory, and biodiversity issues, as well as learning about European aspen (*Populus tremula*) through



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field visits and discussion comparing/contrasting the two continental-scale species.

Aspen Webinar Series—The WAA will continue to partner with Utah State University Forestry Extension to offer aspen-related webinars during 2016 in their “Learn at Lunch” series. Vachel Carter will present the next webinar July 12, 2016 on ancient aspen during the “Populus Period” in the central Rockies. All webinars begin at noon and are one hour in length. Check the [full schedule](#) for other programs.

Summer Aspen Workshops—There are two aspen workshops scheduled for summer 2016: Wyoming and Montana workshops are July 12-14, Wyoming Game and Fish/WAA will host the fifth annual Aspen Days in Lander, Wyoming (Organizer, [Amy Anderson](#), WYGF). U.S. Forest Service will host an eastern Montana aspen workshop on August 30-31 in Red Lodge (Organizer, [Tim Benedict](#), USFS).

COMMENTARY

“Aspen is not a tree, it’s a root system” (Anonymous)

Annie DesRochers, Professor, Forest Research Institute, University of Quebec in Abitibi-Temiscamingue, Canada



While trying to verify if the decline of aspen stands in western Canada was due to diseased root systems, we carried out large-scale excavations that allowed us to discover something of utmost importance for these forests: old parental roots were present in the majority of tree root systems, confirming their sucker-origin, and these roots still connected trees with each other through stand maturity. Moreover, trees that were not originally connected through their parental root had formed root grafts with each other, further increasing the level of interconnection between trees. We also noticed that these connecting roots were quite large and must have represented a large energy demand on the trees for their maintenance. One might guess that

if they constituted too large of an energy sink, trees could simply shed them, but their large woody nature and central position make them a foundation of their root system, not easily abandoned.



Mature aspen stems with connected root systems.

Even after the death of above ground stems, large connecting roots kept most roots of dead trees alive; showing that they were still functional and able to carry water and sugars resulting from the photosynthesis of residual live trees of the stand. These root connections between live and dead trees could also explain why roots of dead trees were not suckering, because suckering-inhibiting hormones continued to be transferred from the crowns of live trees to the communal root system. Slowly, all the energy is spent on maintaining this large communal root system, with fewer and fewer live trees, and portions of the root system start deteriorating and dying. Rapid clear-cutting of all residual stems is then necessary to regenerate declining stands, before too much of the communal root system is lost.

Recent advances in genetics have revealed that aspen stands are more genetically diverse than previously thought. Some have put forward the idea that regeneration by seed was more common than we previously thought. We have also seen stands where the number of clones has more than quadrupled after, compared to before, harvesting, again suggesting that seed regeneration is rather frequent. However, every time that we have excavated mature aspen stands originating from harvest or fire, nearly all stems have



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been of sucker origin. So how can this high genetic diversity be explained?

We hypothesized that clonal diversity maintenance in aspen was facilitated by integration of different clones through natural root grafting into aspen's communal root system. Large-scale excavations indeed revealed many living roots on trees that had been dead for several years, some of them with no other root connections but root grafts to living trees of different clones. Moreover, these roots from dead stumps all had newly formed suckers growing on them, thus carrying over their genotype to the next generation of trees. Acquiring roots of dead trees thus help to maintain extensive root systems, which increases the chances of clone survival, beyond the death of individual trees. Substantial interconnectivity both within clones, as well as between clones, results in formation of genetically diverse but integrated physiological units. Such a clonal structure can significantly affect interpretations of diverse physiological processes taking place in aspen forests.



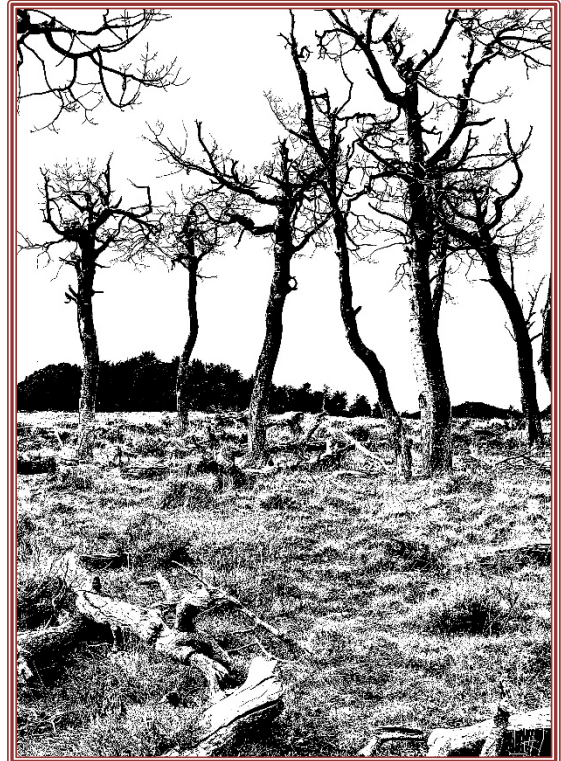
Dead aspen stem with live roots connected to a root from another tree, bearing newly formed suckers.

WAA Creates

"WAA Creates" showcases creative aspen-related contributions from our members. After all, the aim of science is to inform AND inspire. We encourage fiction, folklore, poetry, drawings, paintings, photography, and other artistic expressions that may be captured in a brief-

form newsletter. Please [contact the Director](#) with suggestions and/or feedback on this feature.

Aspen at Nasty Flat (photo)



These few trees are among about 30 that remain of a small one-acre clone at Nasty Flat on the Henry Mountains, Utah. One of the few flat areas with trees, this clone has been loved to near-death by humans and ungulates in search of a shady resting place. If one gets on their knees, you can still find clumps of suckers trying to regenerate in spite of continued heavy ungulate pressure. (Photo taken in early April 2012 prior to leaf-out, 9,580' elevation, using a Canon EOS 60D, 28mm lens set at f/11 and 1/500th second exposure. Original color photo converted to "black or white" image with no gray-tones.)

Douglas Page, Cedar City, Utah

RECENT ASPEN PUBLICATIONS

Assal, T. J. 2016. The ecological legacies of drought, fire, and insect disturbance in western North American



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- Rhodes, A. C., T. Barney, and S. B. S. Clair. 2016. Stand Composition, Tree Proximity and Size Have Minimal Effects on Leaf Function of Coexisting Aspen and Subalpine Fir. *PloS one* **11**:e0154395.
- Rogers, P. C. 2016. Saving Pando: humans are taking measured steps to rejuvenate an ailing giant. *Natural History* **124**(2):32-37.
- Shepherd, W. D., F. W. Smith, and K. A. Pelz. 2015. Group clearfell harvest can promote regeneration of aspen forests affected by sudden aspen decline in western Colorado. *Forest Science* **61**:932-937.
- Tepley, A. J., and T. T. Veblen. 2015. Spatiotemporal fire dynamics in mixed-conifer and aspen forests in the San Juan Mountains of southwestern Colorado, USA. *Ecological Monographs* **85**:583-603.
- Whitbeck, K. L., D. R. Oetter, D. A. Perry, and J. W. Fyles. 2016. Interactions between macroclimate, microclimate, and anthropogenic disturbance affect the distribution of aspen near its northern edge in Quebec: Implications for climate change related range expansions. *Forest Ecology and Management* **368**:194-206.

CONTACT WAA:

Paul C. Rogers, Director, Western Aspen Alliance, Utah State University: [Email](#)

Emmon H. Rogers, *Tremblings* Reviewer/Editor

Website: <http://www.western-aspen-alliance.org/>

