WESTERN ASPEN ALLIANCE

TREMBLINGS

NEWSLETTER & BULLETIN BOARD

Vol. 13(2), May 2022

Partnering to preserve and restore healthy aspen ecosystems

MEMBER PARTICIPATION: The WAA is a virtual science-based community. Send us aspen-related publications, management plans, and media mentions and we'll help spread the word. Contact Paul Rogers, Director: p.rogers@usu.edu.

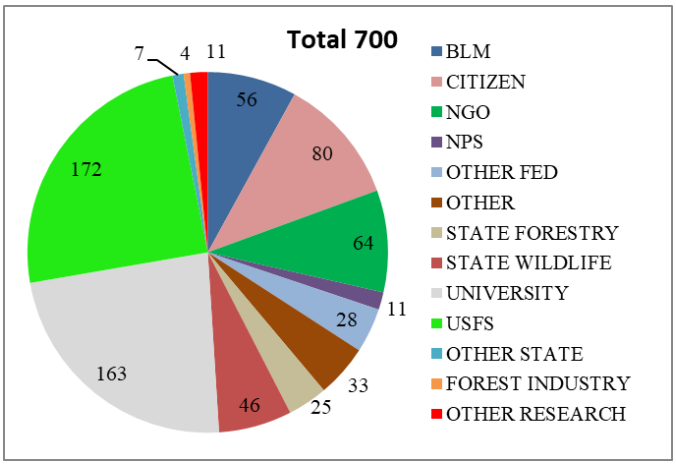
Share *Tremblings* with your friends and colleagues.

New members welcome! Sign up here

WAA HAPPENINGS

Annual Spring Fund Drive—Yes, here we are again requesting donations from all members within your personal comfort level. The WAA has no base grant or university funding; we rely on agency partners and members. Last year's Survey Monkey member poll showed that most members (61%) favored a personal donation over other mechanisms for supporting the organization. Though this is a voluntary gift and is not required to continue WAA participation, we hope modest contributions from many will continue to power the WAA's annual administrative costs. Thank you!

Update on WAA Membership—The WAA has reached another milestone with 700 members spanning North America and 11 countries total. Recent patterns confirm strong USFS and university participation and notable surges in citizen, NGO, BLM, and State Wildlife agency membership.



Ah, spring! Nothing symbolizes this change of season like the bursting of buds. The delicately packed aspen leaflets unfurling with each warmer day spell promise even before their first flutter. In time, these leaves will act as nature's solar panels, garnering precious sunlight and converting it to carbohydrate energy for growth and storage. (Photo: Paul Rogers).

New Oystershell Scale Brief—WAA Brief #8 addressing the burgeoning oystershell scale (OSS) issue in the American West is near completion. This is a joint project between Northern Arizona University, US Forest Service (Region 3) Forest Health Protection, and the WAA. OSS is an invasive species occurring on aspen primarily in the Southwest, though it appears to be expanding to aspen forests further north. We plan to publish the OSS Brief alongside WAA Briefs by the end of May 2022.

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WAA Director Email Change (last call)—WAA Director, Paul Rogers, will have a new email address beginning May 2022. Please update your address book and change his email contact information to p.rogers@usu.edu.

UPCOMING EVENTS

World Wood Day, Aspen & Fire in the West—A cooperative venture between World Wood Day (March 21) and the USDA Forest Service (Rocky Mountain Research Station; RMRS) is presenting a series of videos for international audiences on fire in the Western U.S. WAA Director Paul Rogers and RMRS emeritus scientists Stanley Kitchen and Wayne Shepperd address fire ecology, management, and climate futures. The anticipated release date is May/June, 2022. In the meantime, you may view other fire-related topics for World Wood Day here.

13th NAFEW—The North American Forest Ecology Workshop takes place June 19-24, 2022. There will be an aspen-focused session titled, "Threats to quaking aspen (*Populus tremuloides*) forest health across western North America" on June 23. The *WAA* will host a virtual Happy Hour with aspen trivia during NAFEW (6/24, 17:00-18:00 mountain time). NAFEW is intended as a bridge between science and practice, conservation and utilization, old-timer and newcomer. See the NAFEW website for a detailed schedule of events and instructions about how to register.

NACCB is on for 2022—The North American Congress for Conservation Biology is holding their biennial meeting July 17-21 in Reno, Nevada, USA. The conference provides a forum for discussing new research, developments, and strategies that will inform policy changes and conservation practices. "Restoring Connections and Building Resilience in a Changed World" aims to address conservation science, climate disruptions, and social equity within our respective professions, as well as society at large.

Summer 2022 Aspen Workshops:

- The 10th Annual Aspen Days will be held near Hoback Junction, Wyoming July 13-15, 2022. Contact Chelsea Ramage about reservations.
- Date finalized: California aspen workshop will take place at Markleeville July 21-22. For details, contact Alison Paulson.
- The Colorado Aspen Summit will take place Aug. 9-11 near Granby, Colorado. Contact Gloria Edwards if interested.

We're open to future proposals for aspen workshops in your area. Please contact WAA Director Paul Rogers.

COMMENTARY

Wolf-elk-aspen interactions: Trophic cascade or trickle?

Elaine Brice, Post-doctoral researcher, Cornell University
Dan MacNulty, Associate Professor, Utah State University

As one of the world's first National Parks, Yellowstone is renowned for a dynamic landscape that is home to many charismatic species. As one of the few deciduous trees in the Park, aspen is a valuable member of the ecosystem. A century of decline is mostly attributed to elk herbivory of aspen recruitment, while climatic factors are often regarded as unimportant.

Elk abundance in northern Yellowstone has fluctuated, but numbers reached a peak of ~17,000 in the 1990s. After a 70-year absence, wolves were reintroduced to the Park in 1995-97. Shortly after reintroduction, some researchers noted height increases of several woody-deciduous plant species, including aspen, and hypothesized that such changes were due to wolves killing or scaring elk, a process known as a "trophic cascade." The ability of wolves to cause such sweeping change quickly became a prominent "success story" of predator reintroduction as a tool for ecosystem restoration.

However, as we've recently shown, sampling bias exaggerated most of the published trends of aspen height growth in northern Yellowstone, resulting in an

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overestimation of the role of wolves in boosting aspen recruitment. Although wolves contributed to reduced elk abundance since their reintroduction, we found that hunting of elk outside the Park had an even greater effect on elk abundance and aspen browsing. And while aspen browsing declined with elk abundance from ~80% of suckers in 1999 to ~ 35% in 2021, the median height of regenerating aspen has only reached 130-cm, well within the browsing range of elk. There is also substantial variation in aspen recruitment across the landscape, with 18% of stands having a median height greater than 200-cm, and a similar proportion having no young aspen at all (photo). Thus, the question remains: if elk abundance and browsing have decreased, what is causing such slow and patchy aspen recruitment overall?

One common explanation is that the patchy response is due to a "landscape of fear," meaning elk avoid browsing aspen in areas of high predation risk. We tested this hypothesis and found little evidence of a change in browsing or aspen recruitment due to spatial variation in wolf predation risk (also see work by Michel Kohl and others). What other factors might explain this—chemical defenses, genetic make-up (cytotype) favoring fast growth, or warming climatic conditions?

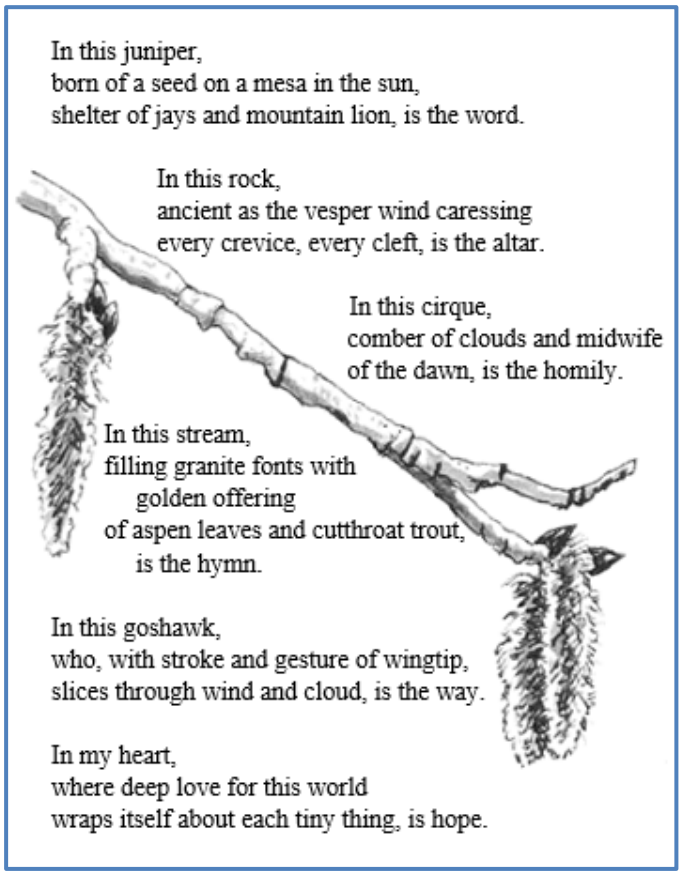
Yellowstone, like many natural systems, is a complex tangle of top-down and bottom-up forces, making it difficult to decipher the effects of wolves on aspen despite over 20 years of examining these questions. Furthermore, research is needed to better understand the indirect effects of all relevant elk predators, not just wolves, on net changes in aspen canopy cover, rather than just stem height which, as both a cause and effect of browsing, is prone to bias. Ultimately, our work suggests that wolves have had a hand in reducing elk abundance and increasing aspen height growth, but this cascade was less of a deluge and more of a trickle than previously thought.

WAA *Creates*

"WAA Creates" requests geographically diverse artistic aspen-related contributions. We encourage fiction, folklore, poetry, drawings, paintings, photography, and other artistic expressions. Send your stuff to share with WAA readers.

Liturgy for Earth

(poem, sketch)



Margaret Pettis
Hyrum, Utah

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From the artist: *I love walking among aspen—stark white candles, ever-present eyes, fiery autumn crowns, papery click and quiver and rattle, contorted survivors of avalanche paths, the exhilarating unfolding of the brightest green. But it is the catkin, first entering the year on a shiver and fluff of breeze, that announces spring to me.*

RECENT ASPEN PUBLICATIONS

A word on Open Access: The Western Aspen Alliance strongly supports open access publishing (CC-BY). Articles with hyperlinks below are available for download and sharing following Creative Commons rules for attribution.

Anoszko, E., L. E. Frelich, R. L. Rich, and P. B. Reich. 2022. Wind and fire: Rapid shifts in tree community composition following multiple disturbances in the southern boreal forest. Ecosphere 13:e3952.

Asmara, D. H., S. Allaire, M. van Noordwijk, and D. P. Khasa. 2022. Tree establishment on post-mining waste soils: species, density, and mixture effects. Canadian Journal of Forest Research 52:1-11.

Brice, E. M. 2022. Quantifying the Indirect Effect of Wolves on Aspen in Northern Yellowstone National Park: Evidence for a Trophic Cascade? Utah State University, Logan, Utah. [PhD Dissertation].

Chen, X., and H. Y. Chen. 2022. Foliar nutrient resorption dynamics of trembling aspen and white birch during secondary succession in the boreal forest of central Canada. Forest Ecology and Management 505:119876.

Ghotsa Mekontchou, C., D. Houle, Y. Bergeron, M. Roy, M. Gardes, A. Séguin, and I. Drobyshev. 2022. Contrasting structure of root mycorrhizal communities of black spruce and trembling aspen in different layers of the soil profile in the boreal mixedwoods of eastern Canada. Plant and Soil. https://rdcu.be/cM2tl.

Molinari, R. L., M. F. Bekker, B. D. St. Clair, J. Bartholomew, R. J. DeRose, S. G. Kitchen, and S. B. St. Clair. 2022. Facilitation differentially affects competitive responses of aspen and subalpine fir through stages of stand development. Ecosphere 13:e3957.

Morell, V. 2022. Massive wolf kill disrupts long-running Yellowstone park study. Science 375:482-483.

Nigro, K. M., M. E. Rocca, M. A. Battaglia, J. D. Coop, and M. D. Redmond. 2022. Wildfire catalyzes upward range expansion of trembling aspen in southern Rocky Mountain beetle-killed forests. Journal of Biogeography 49:201-214.

Raizada, R., R. K. Gaur, and B. R. Albrectsen. 2022. Recursive partitioning to prioritize morphometric traits that separate Aspen specialist Chaitophorus aphid by species and stage. International Journal of Tropical Insect Science 42:941-946.

Sharma, M. 2022. Climate Effects on Black Spruce and Trembling Aspen Productivity in Natural Origin Mixed Stands. Forests 13:430.

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