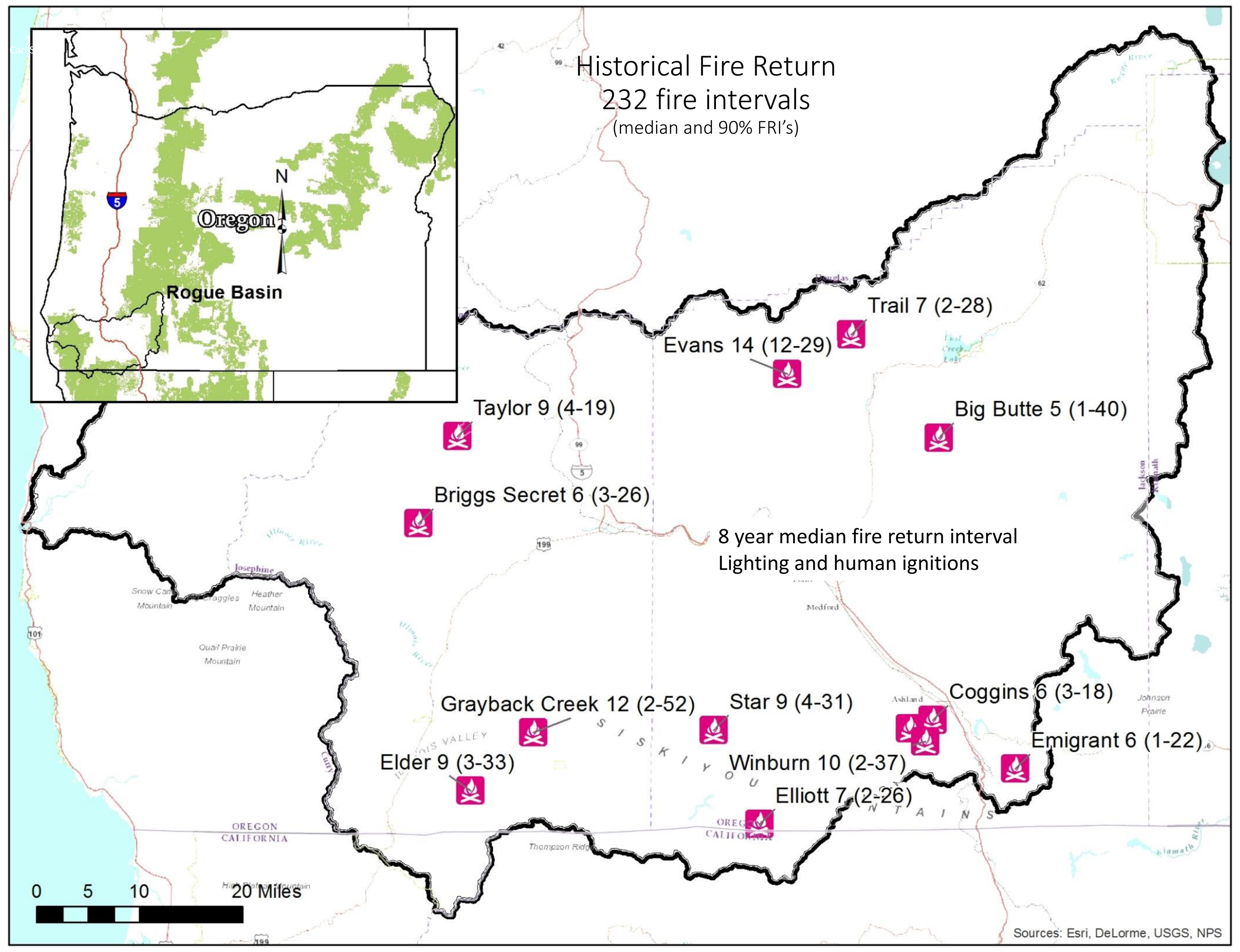
Restoring fire regimes of southwestern Oregon: density and species composition of a forested landscape

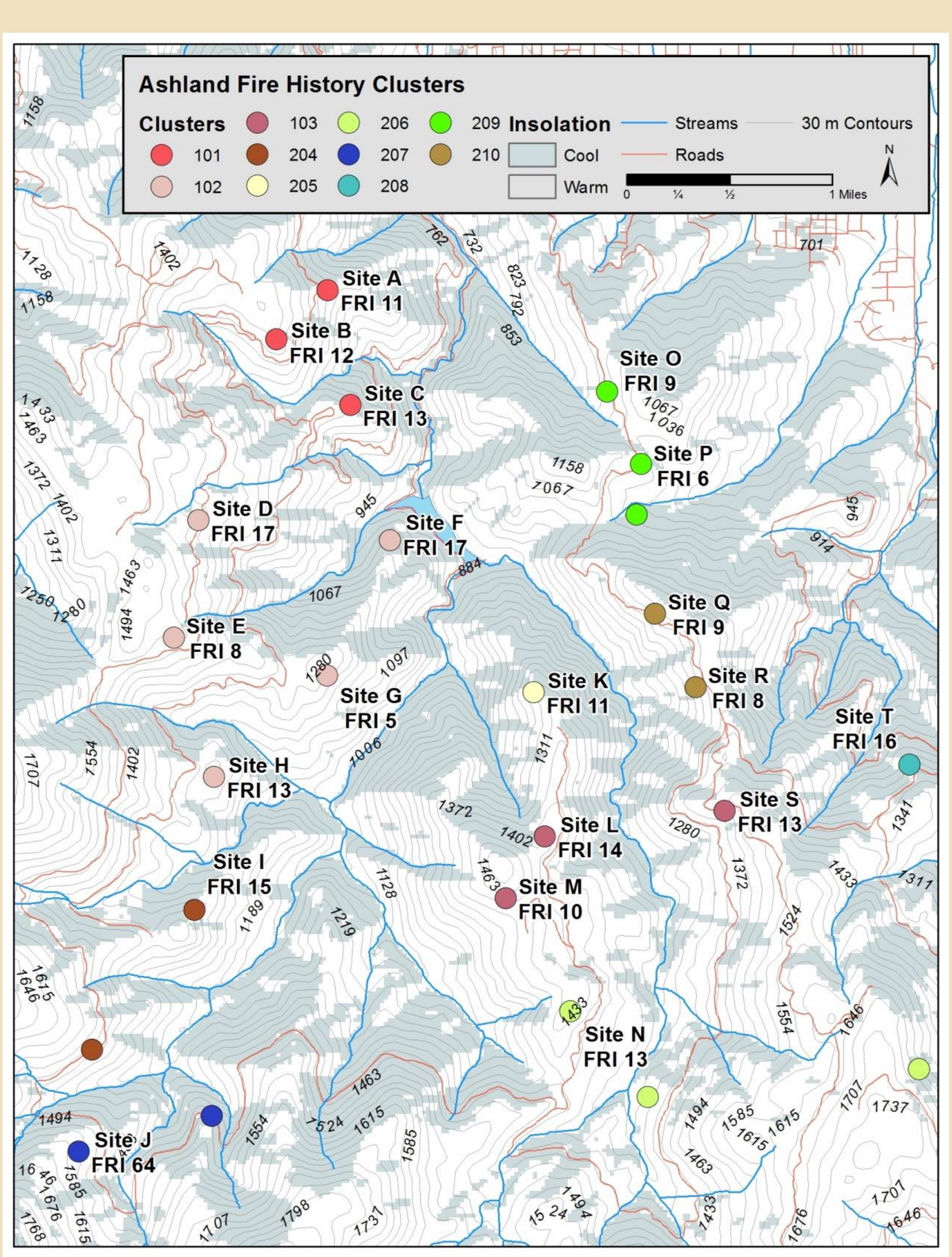
Kerry Metlen[1] Ph.D., Darren Borgias– The Nature Conservancy
[1]Contact: kmetlen@tnc.org

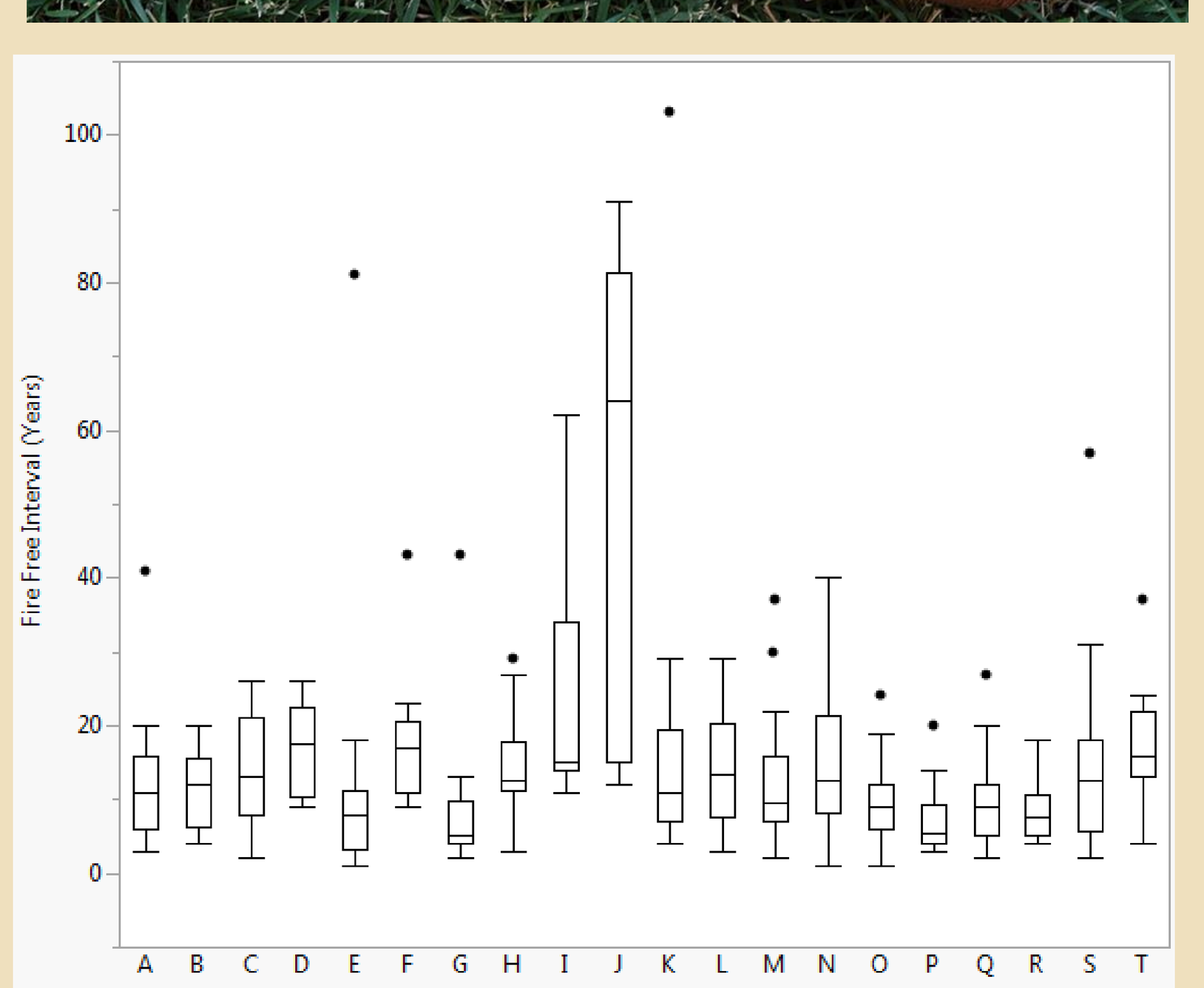


Historically, Fires Were Frequent in the Rogue Basin

We sampled 124 fire scarred trees at 13 sites across the Rogue Basin in stands ranging from 1,900-5,000 feet. Fire scars were sampled predominately on dry ridges and midslopes, biophysical settings found across 59% of Rogue Basin dry forests, but fires occurring in these settings have potential to spread widely.

The median fire return interval of fires that scarred at least two trees at a site was 8 years, ranging from five to 14 years. Across all sites 90% of the documented fire return intervals fell between two and 28 years, the majority falling between five and 12 years.



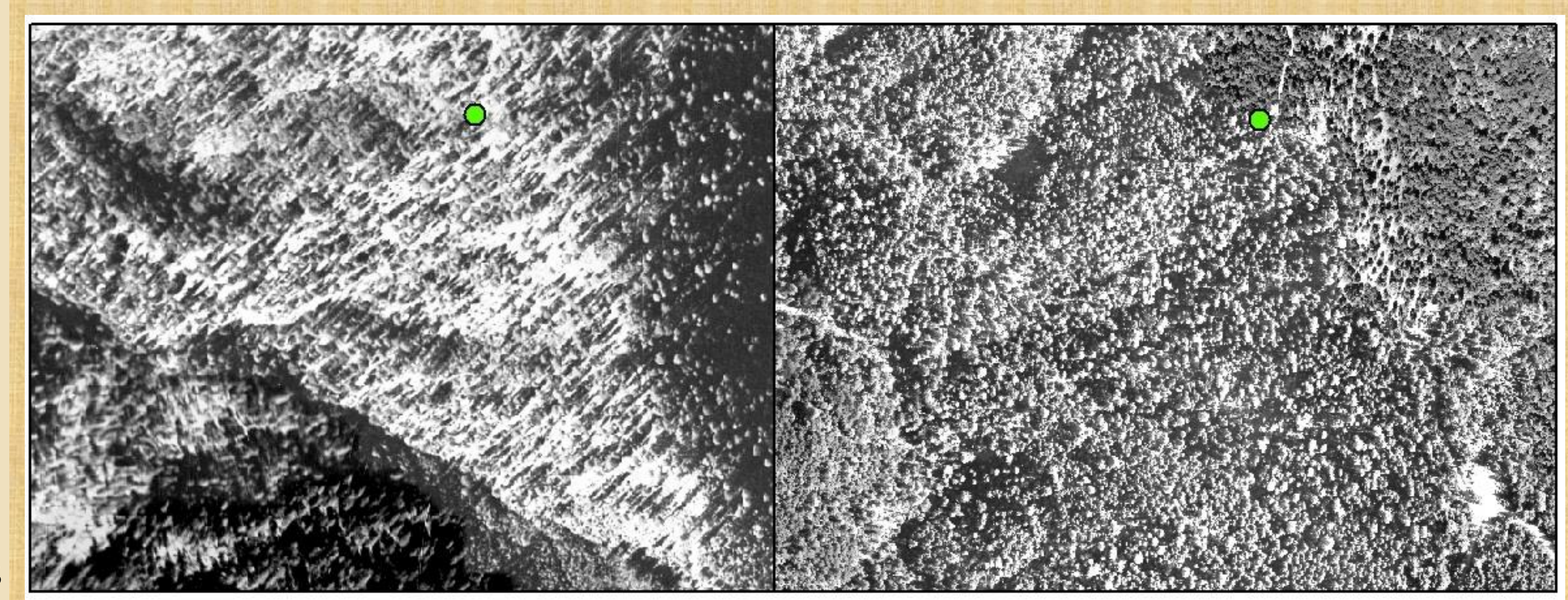


Historical Fires Were Similarly Frequent in the Ashland Forest

In Ashland we crossdated 233 fire scar samples at 20 sites. The median fire return interval of fires scarring more than one tree was 12 years historically, with fire recorded *every other year* somewhere in the watershed. Two or more sites recorded fire on 51% of those years, though this did not happen after 1911. The results indicate that many of the Rogue Basin forests may have missed from four to 12 fire events.

Abstract

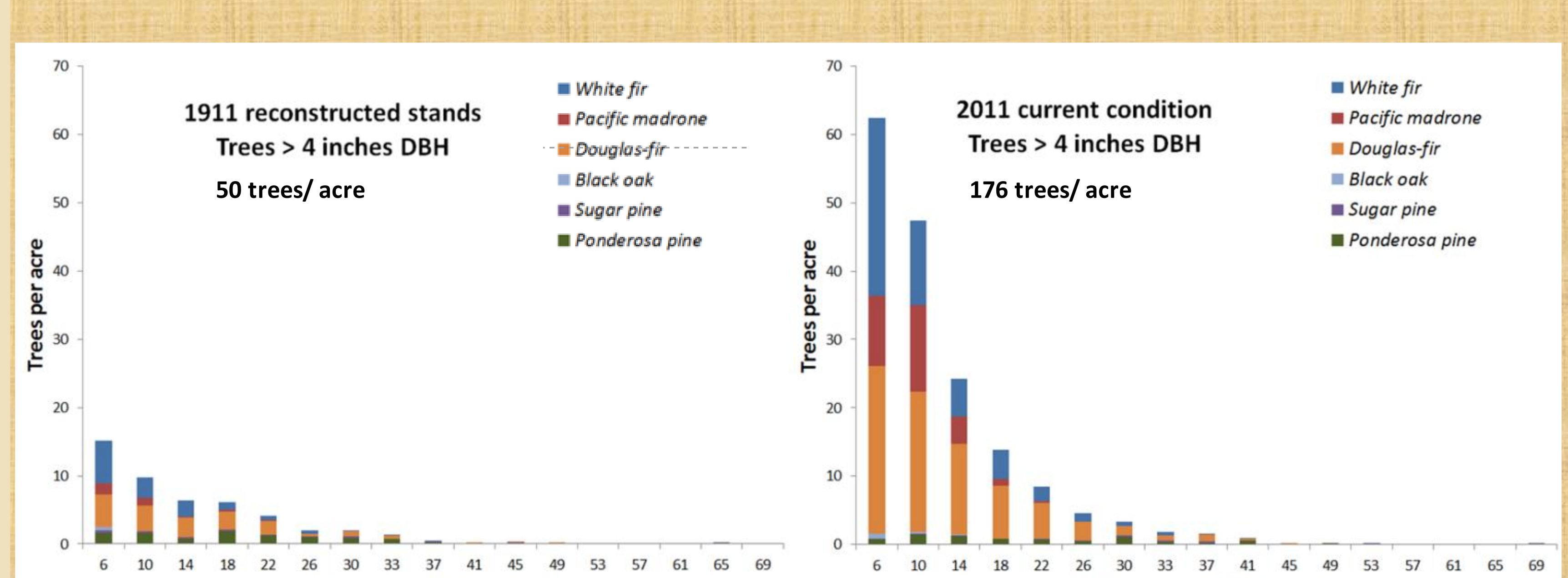
Landscape scale forest restoration thins out excess, small, shade tolerant trees and restores a more natural fire regime to increase forest adaptive capacity to a changing climate and resilience to fire. Mechanical treatments are informed by historical reference conditions, tempered to protect and preserve existing closed forest habitats, and guided by society's needs and concerns. The Ashland Forest Resiliency Stewardship Project is doing this work in the mediterranean mixed conifer hardwood forests of southwestern Oregon. Multiparty monitoring, led by The Nature Conservancy, has been ongoing since 2010. Stand exam plots and cut tree tallies allow characterization of treated stands. We evaluate the extent to which the treatments have restored historical stand structure, and species composition relative to a locally derived reference data set based on 0.25-acre plots stratified across the project area (n=50) where we reconstructed forest species composition and structure back to the date of last widespread wildfire, 1910.



Coggins Saddle -1939 **Coggins Saddle - 2011**

Without Fire Forests Have Become Very Dense

In the aerial photo (above) an increase in forest density is apparent in the Ashland watershed. Systematic evaluation of these historic aerial photos is warranted.

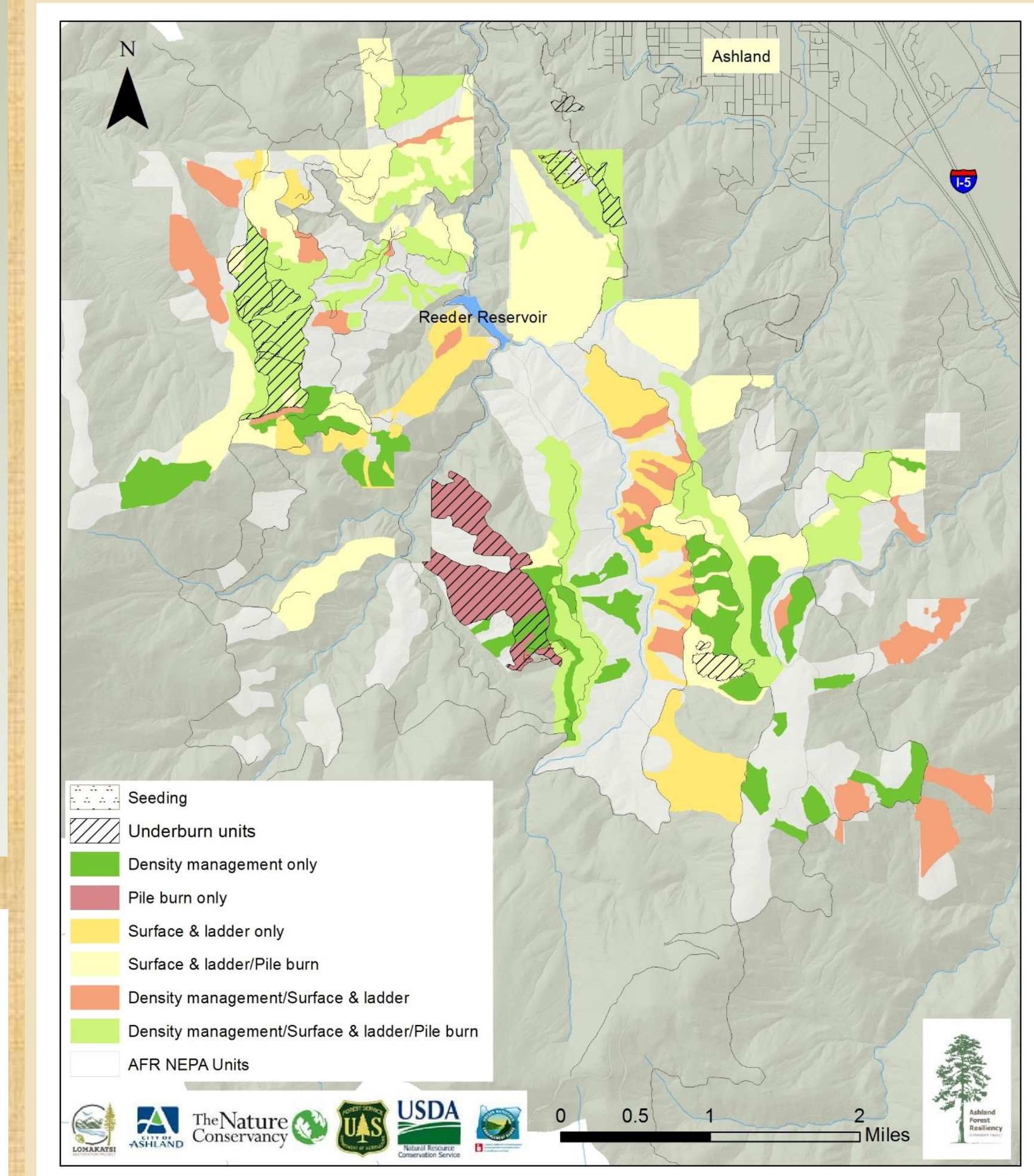


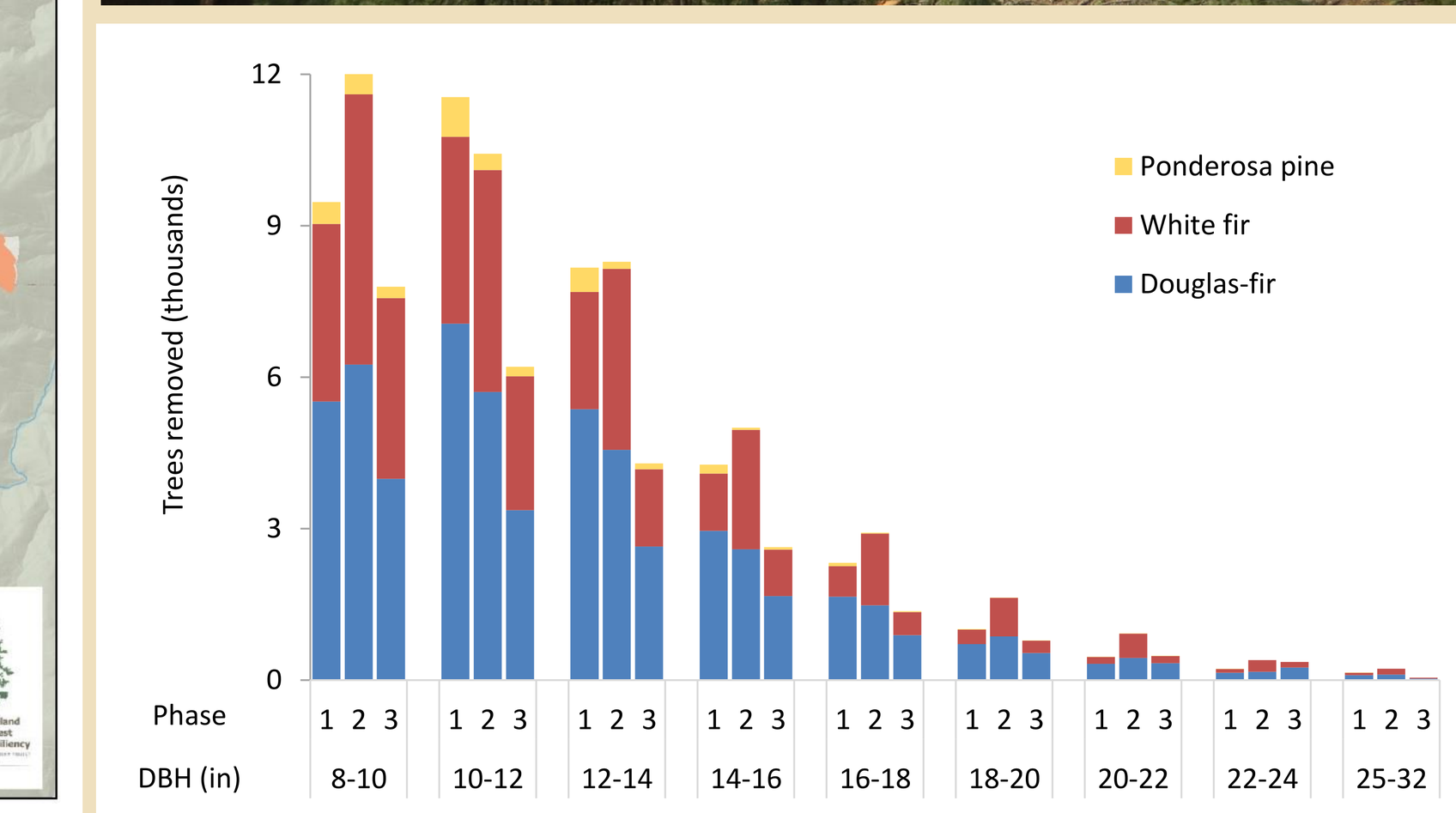
Reconstructions to Quantify Change

A stratified sample of 0.25 acre plots (n=50) was used to quantify changes in forest structure and species composition in the Ashland forest. Over 400 trees were cored to estimate 100 years of growth by species and biophysical setting. These stand reconstructions found dramatic increases in forest density with most of the increase coming from small shade tolerant trees species, largely white fir, Douglas-fir ,and pacific madrone.

Thanks to the Northwest Conservation Fund, Oregon Watershed Enhancement Board, the USDI Bureau of Land Management, and the USDA Forest Service for funding

Thanks to our field crews, TNC volunteers and Carl Skinner and Eric Knapp of the Pacific Southwest Research for all their work and support



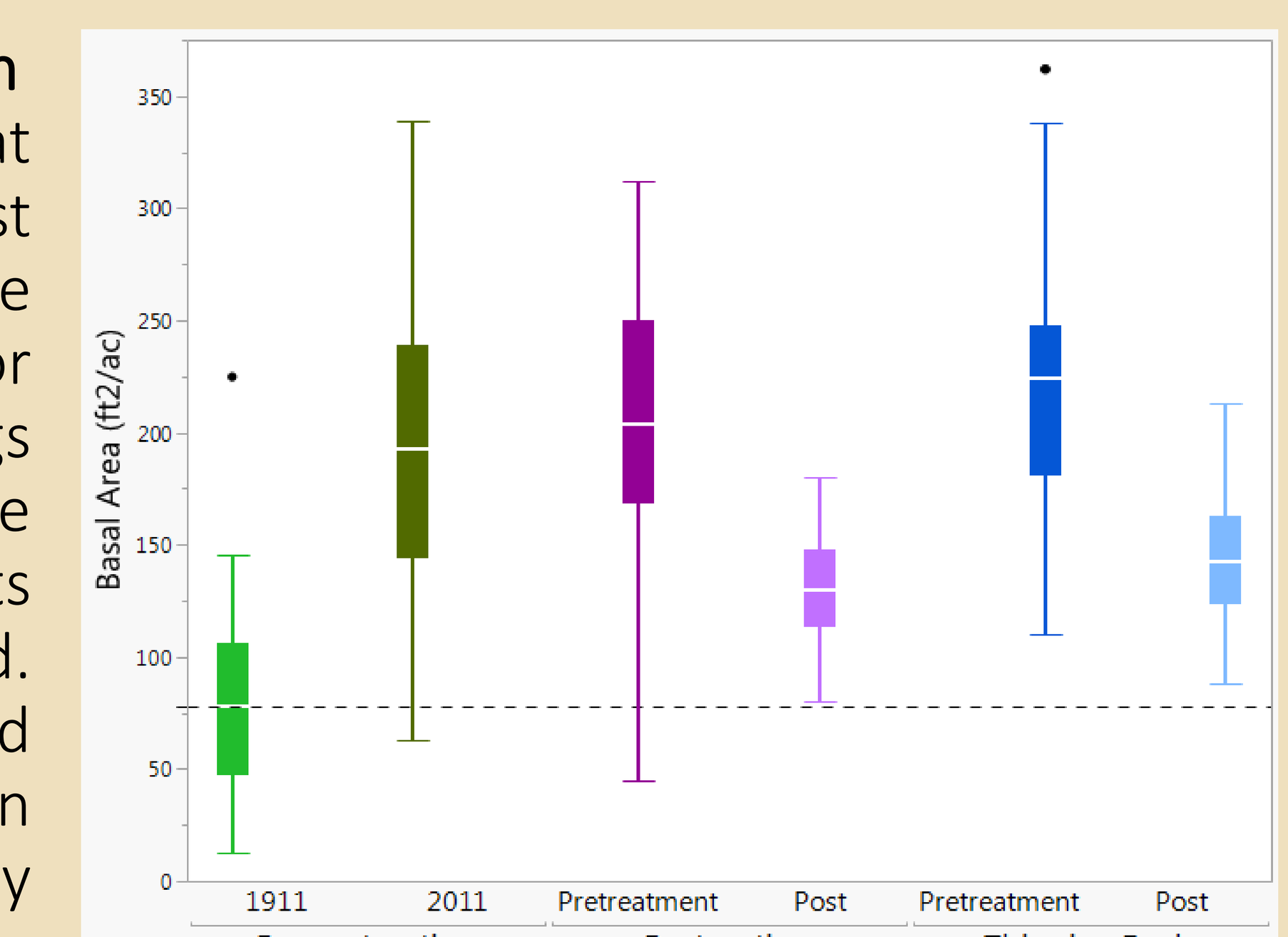


Forest Restoration and Fuel Reduction in the Ashland Watershed

A combination of mechanical non-commercial and commercial fuel reduction treatments as well as controlled burning have been implemented on 5,500 ac to-date, with a total of 7,600 ac planned. Most treatments have prioritized maintaining canopy cover and suppressing ladder fuel regrowth. Commercial treatments were implemented on 2,698 ac but open forest restoration was only the focus on 662 ac. When trees are removed that are merchantable, they are sold to local mills and that money is used to do more work for the health of the forest. This work was completed in three phases and each tree to be sold was measured. The majority of trees removed were Douglas-fir and white fir and less than 16 inches at breast height

Historical Density and Forest Restoration

Our stand reconstructions show that basal area of the Ashland forest increased from a median of 78 ft^2/acre to nearly 200 ft^2/acre. Units selected for restoration and fuels focused thinnings had pretreatment densities comparable to the reconstruction plots. Treatments reduced basal area by more than a third. Interestingly, restoration focused prescriptions did not result in posttreatment densities significantly closer to reference forest densities.



Historical Species Composition and Forest Restoration

Forest references showed significantly higher proportions of early seral tree species, such as ponderosa pine and black oak in 1911 than in 2011, and in warm settings than in cool. Even though commercial treatments were largely in warm settings, the proportion of early seral trees remained quite low.