

AMEX Provenance Expansion

The Sierra Nevada Adaptive Management Experiment is a long-term, statewide study evaluating the response of various management alternatives to future climate scenarios. Treatments are being installed on forest ownerships throughout the Sierra Nevada including UC Berkeley's Grouse Ridge Research Station (**GRRS**), LaTour Demonstration State Forest (**LDSF**), Mountain Home Demonstration State Forest (**MHDSF**), Stanislaus-Tuolumne Experimental Forest (**STEF**), and Eshom Ecological Restoration Project on the Sequoia National Forest (**EER**).

The following treatments represent a suite of plausible approaches that managers may use to address ongoing and novel forest stresses¹ related to climatic change.

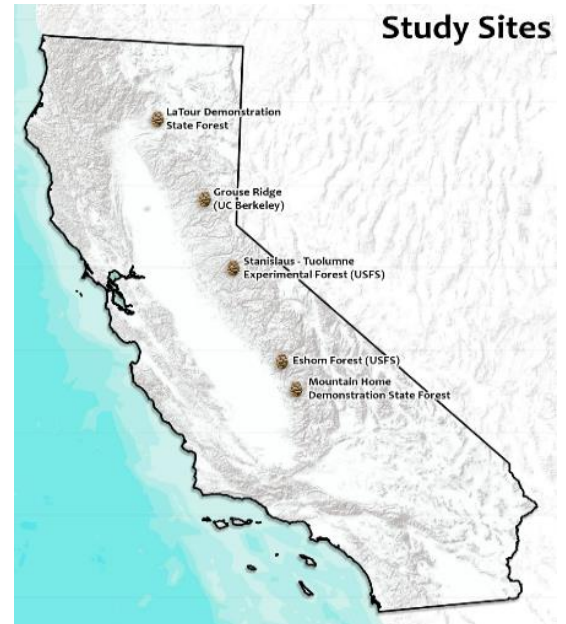
- *Resilience* (conventional stocking levels and structural heterogeneity)
- *Resistance* (relatively low stocking levels dominated by large trees)
- *Transition* (low stocking levels with canopy openings to facilitate the trial of new species plantings)
 - *Nested Provenance Trial* (See Below)
- *Control* (no treatment over the next 6 years)

Request for Collaboration

A core component of this study is determining how novel species and seed lot composition will perform in a future climate where locally occurring, and presumably locally adapted, species and/or seed lots become incompatible with local environmental conditions. In other words, this treatment represents the scenario where current forest composition can no longer be maintained, and managers must therefore intervene through assisted migration of non-local species or seed lots. With the growing risk of catastrophic loss from wildfire, there is an urgent need to inform how future forests may continue to provide

commercial and ecosystem services under new climate conditions and disturbance regimes. Here, we are looking for additional partners to host provenance trials within recently burned, high severity perimeters to expand the scope of the study and test these responses in real post-disturbance time.

¹ Including but not limited to: Regeneration failures, Mortality related to drought stress, and High severity fires.



Timing of treatments and forest types

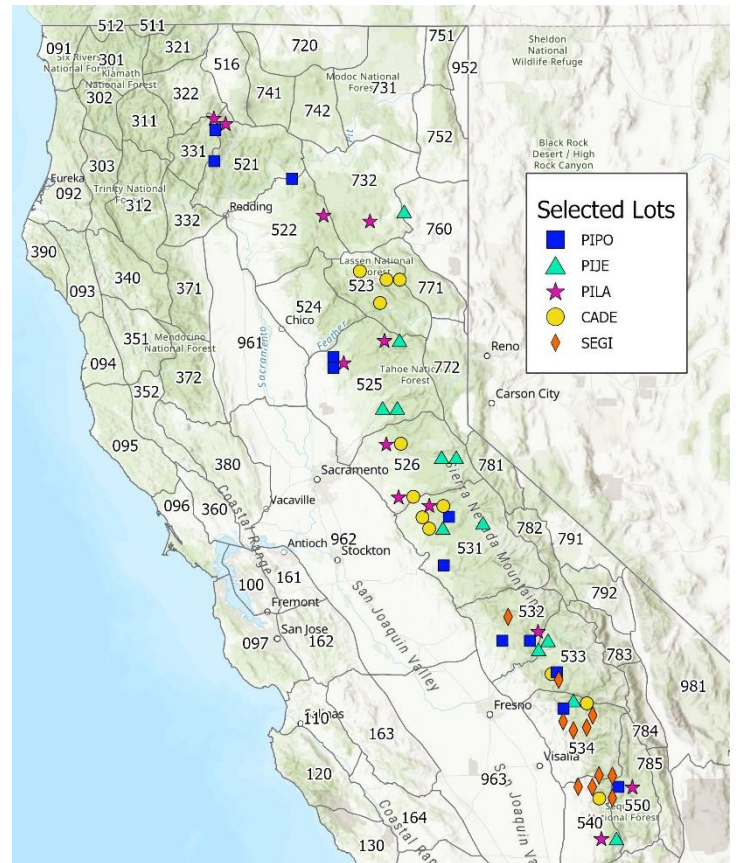
To establish a network of replicates under comparable conditions in western sierra Nevada forests, the following forest types are requested:

- Site I, Site II, or Site III mixed conifer lands
- Forested areas burned in 2020 with higher severity effects, and with plans to be salvage logged to create structures with 0% canopy cover and low surface fuels. Follow-up herbicide control would be preferred.
- Openings of at least 1 acre in size, with 6 replicates at each site/landowner (large openings may be able to accommodate multiple 1-acre planting replicates across one area).

Species to be planted include sugar pine, ponderosa pine, Jeffrey pine, giant sequoia, and incense cedar from 12 provenance regions representative of the latitudinal gradient of California's west slope Sierra Nevada mixed-conifer forest type.

Seedlings will be provided by the researchers. Individuals are to be planted in randomized blocks at a 5.5' spacing for the first 6 years to test seedling performance, then thinned to an appropriate planting density to track provenance performance as trees mature into different form classes. An estimated 1440 seedlings will be planted per acre.

At present, seedlings are available for a Spring 2021 planting with potential for additional planting in Spring 2022. The expectation is for the landowner to protect the planting site with reasonable effort for a period of at least 6 years and ensure the first round of follow-up measurements. Ideally, the landowner will be willing to participate for the duration of the decadal study by ensuring the integrity of the study area.



Potential collaborators should contact:

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Proposed Expansion Footprint

