

## Giant Sequoia Genetic Conservation

### Sierra Pacific Industries Annual Activities Report

This is the first year that we are filing this type of report. The below information is a short summary of earlier years SEGI activities, along with 2013. Contact Glenn Lunak to request additional information.

- **2009 / 2010 USFS Foresthill SEGI Provenance Trial assessment** – Established by Finns / Libby in 1981. Managed by USFS. Sponsored by SPI and SRL. Investigators - Chis Valness (HSU), John-Pascal Berrill (HSU), William Libby (UC, Berkeley retired). Groves growth and morphology assessment.
- **SPI SEGI plantations 2010 evaluations** – SPI evaluated 131 of its 400+ plantations with SEGI planted in it and found that SEGI appears to have successfully adapted to a broad range of forest sites. The evaluations work was published in the Western Journal of Applied Forestry, October 2012; 27(4):196-204, Kitzmiller, J.H. and G. Lunak. *Growth of Giant Sequoia Compared to Ponderosa Pine and Other Mixed-Conifers in California Plantations*.
- **SEGI genetic conservation program planning and testing 2011/2012** – Acquired SEGI seed from 3 groves; Mountain Home, Redwood Mountain, and CBTSP, South Grove. The seed did not meet the collection standards for grove genetic sampling. The Mountain Home seed came close. SPI has reforestation expertise. The intent was to test our plan and make changes or adjustments for planning, growing, deploying, and managing a successful program. We planted 29,000 SEGI seedlings / grove x 3 groves = 87,000 seedlings. Planted 60 SEGI /acre mixed with other local conifers. 10 units planted / district x 8 districts = 80 units. Plantations elevations range = 2,500' to 6,100'. Fall 2012 survival survey averaged 80% SEGI survival.
- **Genetic conservation master landscape design** – SPI Northern CA ownership, 8 districts, 38 to 41.5 degrees latitude. Plant 2 units / SEGI grove / district = 16 units plant / grove. Plant with, native conifers, mixed species; SEGI ranging from 20% to 25% mixture. Grow/plant 20,000 SEGI / grove. Manage SEGI genetic conservation (GC) plantations like any other plantation, but always favor SEGI for spacing distribution through-out the plantation. Once early responses to each planted micro-site are evaluated, a designated sub-set of groves will be selected to manage as groves in perpetuity. SPI reforestation data base – special identification of SEGI-GC units. Created a SEGI-GC rational data base that includes specific seed source (grove and collection lat/lon location) tracking; tied into cones collected, growing, planting design, and actual planted.
- **Calaveras Big Trees State Park 2012 cone collection** – Two groves; north and south grove. Created a GIS cone collection (sampling) plan within each grove polygon with a goal to sample 20 locations / grove. Downloaded the sampling plan into GPS units which were used to guide the collection crews through the groves and then record the sampling locations.  
**Cone Collections May 2012** – Our plans are to collect SEGI cones from the ground after a significant weather event, where cone bearing limbs are broken out of the trees. There was a wind storm at the park, November 2011. Teri Grifis, Cal Fire, LA Moran Reforestation Center director at Davis, spent a day training SPI how to identify viable seed SEGI cones. We learned a lot doing the CBTSP cone collections. The good seed yield was minimal for SEGI-GC growing

needs. We found that identifying target cones would have been easier and the viable seed yield would have been greater if cone collections were completed soon after a wind storm.

**Cones collected** – Actual collection locations were GPSd with the waypoint used for seed lot identification. The waypoint / seed lot identification number to be used for processing, growing, sorting and planting tracking.

**Cal Fire, Davis cone processing**

**North Grove** – Total 11 bushels collected, 14 sampled locations = 14 seed lots; germination range of 15% to 36%

**South Grove** – Total 13 bushels collected, 18 sampled locations = 18 seed lots; germination range 22% to 48%.

- **2013 Groves cone collection permits** – SPI was issued permits from the NPS and permits for some of the USFS groves. Mountain Home SF and some other grove managers agreed to issue a simple cone collection permit. SPI will ask to renew the permits for 2014.
- **2013 SEGI cone collections** – There were no grove significant weather events in 2013 and there were no cone collections.
- **Grow CBTSP SEGI seedlings 2013 at Cal Forest Nursery** – Total 32 seed lots grown in styro-8 containers. Total yield = 35,000 seedlings; total 2013 fall planted = 7,200; total to spring 2014 plant = 27,800.
- **Plant CBTSP-Genetic Conservation units 2013, 2014** – 2 units / grove / district on 8 districts = plant 16 units / grove x 2 groves; plant a total of 32 units. Plant 2 units mixed north and south grove (as per Libby – future hybrids) / district = 16 units mixed. Grand total units plant plan = 48. Plantations elevations range = 3,000' to 5,800'; number units plant in the Cascades = 21; number units plant in the Sierras = 27.
- **Research 2014 – Fresno Pacific University Biology Department** - Deanne Bell  
Study genetic diversity within and/or between populations of SEGI. Grow CBTSP seedlings, in larger containers another season, to extract material from the cambium for DNA analysis. Seedlings from 32 cone sampling locations from 2 groves. SPI will provide the lat/lon of the sampling locations.  
**January 2014** – Cal Forest Nursery will label and transplant additional CBTSP seedlings, which are available for other research or trials. If you are interested, contact Lunak.

**GROVE MANAGERS – CONTACT GLENN LUNAK AFTER A SEGI GROVE, LIMB BREAKING, SIGNIFICANT WEATHER EVENT.** With the current drought, there may be opportunity to collect cones during the winter months.

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