

MINUTES

Genetic Conservation Technical Advisory Committee

Meeting Nov. 25, 2015, Meeting held at the University of BC

Attending:

GCTAC members: Pia Smets (Chair), Sally Aitken, Charlie Cartwright, Jun-Jun Liu, Dave Kolotelo,

Attending remotely: Alan Vyse, Randy Moody

Others attending: Jack Woods, Don Pigott, Marie Vance, Brian Barber

Regrets: Tongli Wang, Michael Murray

1. Catalog update – T. Wang / P. Smets

Tongli Wang has finished deriving cover % from the VRI database. Maps based on this data, maps based on updated botanical plot data, and integrated (mostly averaged) maps were sent to GCTAC for review in October. The second round of maps and comments will circulate to a wider audience. Edge populations will be trimmed based on “Report 053” (habitat specificity). Important edge populations, if under-protected, will be singled out for extra conservation attention.

Action: For interior spruce and sitka/white spruce hybrids, data from genomic studies will be overlaid on cover % data to achieve meaningful delineations of “representative populations” for pure species and hybrids. Such an approach may be applied to other hybrid zones, if the importance and distinctiveness of the hybrids warrant it.

Action: Don Pigott will draw a map of occurrence for the maritime juniper.

2. Seed Bank overview - Dave Kolotelo

Dave provided an overview of the seed bank, the GCTAC ex-situ collections. The species previously identified as priority which have not yet been collected are the ones that are more difficult or expensive to collect. He hopes to expand water activity testing to ensure the quality of the stored seed, but that depends on available funds for new equipment. Dave suggests maintaining the funding level for seed collections at \$25K annually at least.

Action: Pia will adjust the budget numbers in the draft strategic plan to reflect this.

3. Ex-situ collections - Don Pigott

During 2015, collections were made in 14 locations. They include *Populus trichocarpa* (5), *P. tremula* (1), *Acer macrophyllum* (2), *A. glabrum* (2), *Betula papyrifera* (2) and *Juniperus maritima* (2). Because willow seed has such a limited period of viability, Don recommends using cuttings to make a clone bank for willow species. Establishing an inter-situ clone bank is also a possible route for juniper. Though Don is using collaborations to obtain seed where possible, the representative populations which are still missing in our collections, are more remote, more difficult, and will cost more to harvest than the first two thirds of the collections.

4. Whitebark Pine genomics - Jun-Jun Liu

Jun-Jun presented results from whitebark pine genomics work at the Pacific Forestry Centre. 525 WBP seedlots (25 from BC) were tested using artificial inoculations and hormone treatments. Transcriptome analysis revealed that >1,000 genes were regulated in tree defense. Association of genomic data with phenotypic data revealed a number of SNPs with some level of association. The highest R^2 between a SNP and seedling resistance is around 10%. A detailed association analysis is ongoing by using 10K SNP chips at PFC. It is expected that a SNP chip for early selection of resistant WBP genotypes could become available at some not too distant time in the future.

5. Update on grand fir results - Marie Vance

This re-analysis of previously collected data reveals that most genetic variation for grand fir resides within populations (>90%). Populations that are further apart are genetically more different. Two groups can be distinguished: coastal and interior populations. This study is now considered complete.

6. Update on Larix lyallii results - Marie Vance

Seed collection for this project was partially sponsored by GCTAC in 2013. 61 populations of subalpine larch were sampled across the species' natural range. Two populations of western larch were included as outgroups for phylogeographic analysis. DNA was extracted from all samples (approx. 1,500 trees) with 80% success. To date, five individuals per population have been genotyped using restriction-enzyme associated DNA sequencing (RAD-seq). Analysis methods and preliminary results were discussed. Additional sequencing will be required to obtain more accurate estimates of population-level statistics.

7. Whitebark pine field testing update - Charlie Cartwright

The four new field trials have been established according to plan, and extra seedlings were sold at cost. Due to variable germination, the first trials contain more families than the last. This project is in its third year of a total duration of 9 years. Charlie is still considering seed processing techniques which are less labour intensive than nicking.

Charlie also reported on Michael Murray's WBP inoculation work, which is in year 2 of 4 and on target: The 2015 inoculations went as planned. Inoculated stock has been planted out in raised beds at Kalamalka. The 2014 families were re-inoculated.

A nursery bed planting at Skimikin Seed Orchard supplements the field test. Skimikin's mild temperatures, irrigation and adjacent ribes plants in western white pine clonebanks will ensure better seedling growth and high natural rust infection rates.

Splitrock Environmental Sekw'el'was in Lillooet has started stratification of the new seed sources, which are to be inoculated in 2016.

Considerable assistance was provided by retiring Pine Technician Vicky Berger. The efforts of Skimikin Nursery, Skimikin Seed Orchard, Parks BC, Washington DNR, and Dorena Genetic Resource Center for help getting the trees into the ground are much appreciated.

8. Update on WBP Recovery plan - Randy Moody

A new version of a provincial recovery plan is in the works and nearing completion. Don and Randy are working on a WBP best practices manual, to help educate companies, which are still cutting more mature WBP than is being planted.

9. Discussion: GCTAC role in WBP provincial recovery plan

10. Financial matters

Charlie wants to ensure that there is room in the next budget for relabelling existing whitebark pine parent trees, as well as for rust transects at those sites (for efficiency). This has dropped out of two previous budgets and as time goes on, more tree labels will be lost.

Action: Pia will make sure this item is preserved in the budget

11. Proposed changes in the GCTAC strategic plan

This item was deferred to a future online meeting. Further amendments to the draft document are invited.

Action: Pia will prepare another draft for circulation